JANUARY, 1959

TRAFFIC ENGINEERING

Traffic Engineering in Tomorrow's Transportation

Vehicle Speeds and Volumes Using Sonne Stereo Continuous Strip Photography

Exit Speeds in San Francisco

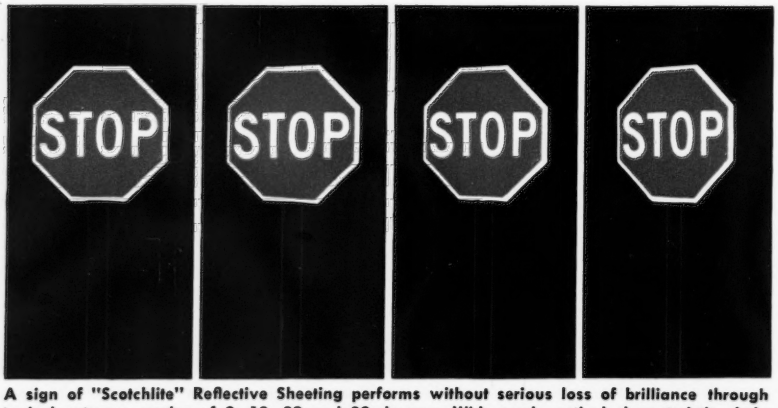
INSTITUTE OF TRAFFIC ENGINEERS
ITE
FOUNDED 1930

What characteristics should an effective traffic sign possess?

Broadly speaking, the answer to this question lies in investigation of 4 vital factors. As you may guess, the first of these is performance, far and away the most obvious sign feature to motorists. And, after this come the equally important economic considerations of sign fabrication cost, installation and maintenance ease, and durability, or useful length of life. Let's look at each more closely.

Performance

A motorist on the road after dark needs the help of traffic signs even *more* than a daylight driver. Accident statistics bear this out. With growing traffic volume—20,000,000 vehicles on the road after dark—the need for modern 24-hours-a-day signing cannot be denied. Whether the sign is a 24″ x 24″ curve warning or an 8′ x 10′ guide panel, *reflectivity* is a characteristic an effective sign must possess.



A sign of "Scotchlite" Reflective Sheeting performs without serious loss of brilliance through typical entrance angles of 0, 10, 20 and 30 degrees. Wide angle optical characteristics help compensate for road curvatures, installation inaccuracies and accidental or deliberate damage.

Brilliance of "Scotchlite" Reflective Sheeting doesn't "black out," even in rainy weather. All-weather visibility of shape, color and legend means full-time traffic sign effectiveness.

Moreover, since the need for communication is greater after dark, the need to show all three elements of a traffic sign—shape, color and legend—is also greater. A sign that only shows one of these elements after the sun goes down is only doing 1/3 of its job. A modern sign should show all 3 to work for full-time safety at 100% effectiveness.

Effective communication in all weather is another desirable modern traffic sign performance characteristic. Federal Government specifications (military specification R 13689A) call for sign material that maintains *at least* 80% of dry reflection when subject to rainfall testing. The higher the percentage, the better the sign . . . for again, motorists need the help of traffic signs most when driving conditions are the worst.

The final performance factor is angularity. Typical tests of sign materials at viewing angles of 0°, 10°, 20° and 30° quickly show that a truly effective sign material will retain high reflective quality through any angle of approach. It allows you to put each sign where it ought to be. Wide angularity gives you a measure of compensation for installation inaccuracies and for road curvatures. Also, if a sign is accidentally or deliberately twisted or bent, it will still communicate because wide angle reflectivity keeps the sign message from disappearing.

Durability

This is the first of the economic considerations. You naturally want signs that withstand weathering well enough to fit into your normal sign maintenance cycle. And you want reflectivity to remain high throughout the sign life so that effective communication with the motorist is not interrupted by decreased brightness.

Economy

For economy in effective signing, you want the lowest overall dollar cost consistent with desired performance and durability characteristics. The material that gives you this figure—(formed by dividing length of useful life into the cost of fabrication, installation and maintenance)—will minimize the true cost of communicating with the motorist.

Fabrication

Sign fabrication should be fast, clean and foolproof to insure uniform signing at lowest cost. Highest optical performance depends on a quality controlled sign material not subject to variations in technique or conditions such as humidity and temperature.

The material you choose will also provide more flexibility if it lends itself to both machine and hand application to any kind of backing. For further simplification, it should give you quick, easy refurbishing of old signs, flat or embossed, as well.

These four primary factors and their parts, according to leading engineers, make up the characteristics an effective traffic sign should possess. How do you get all of them at once? We believe there is only one sign material which provides them all: "Scotchlite" Reflective Sheeting. This is the precision all-weather sign material that can give the performance motorists need, with the durability and ease of fabrication and maintenance that you demand.

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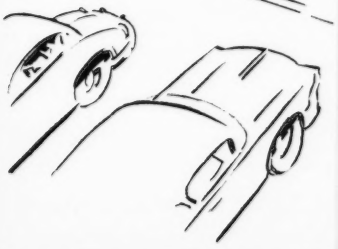

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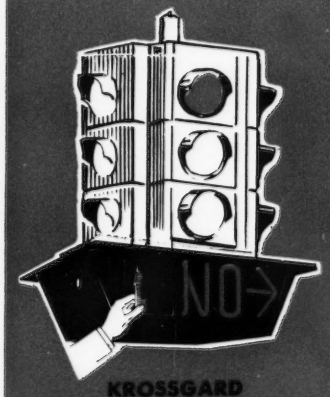

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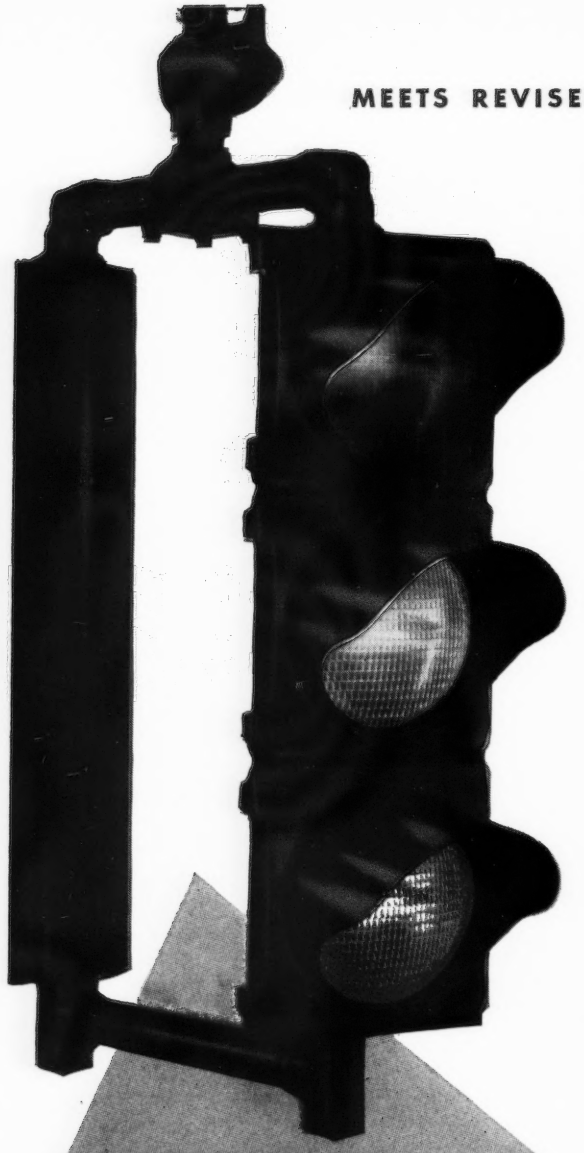

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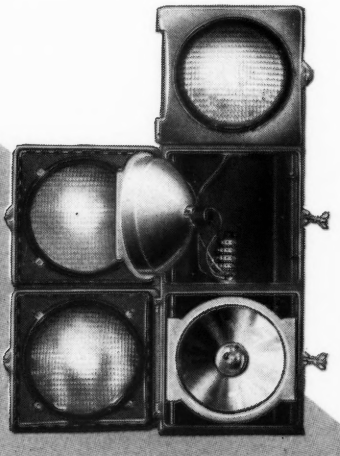

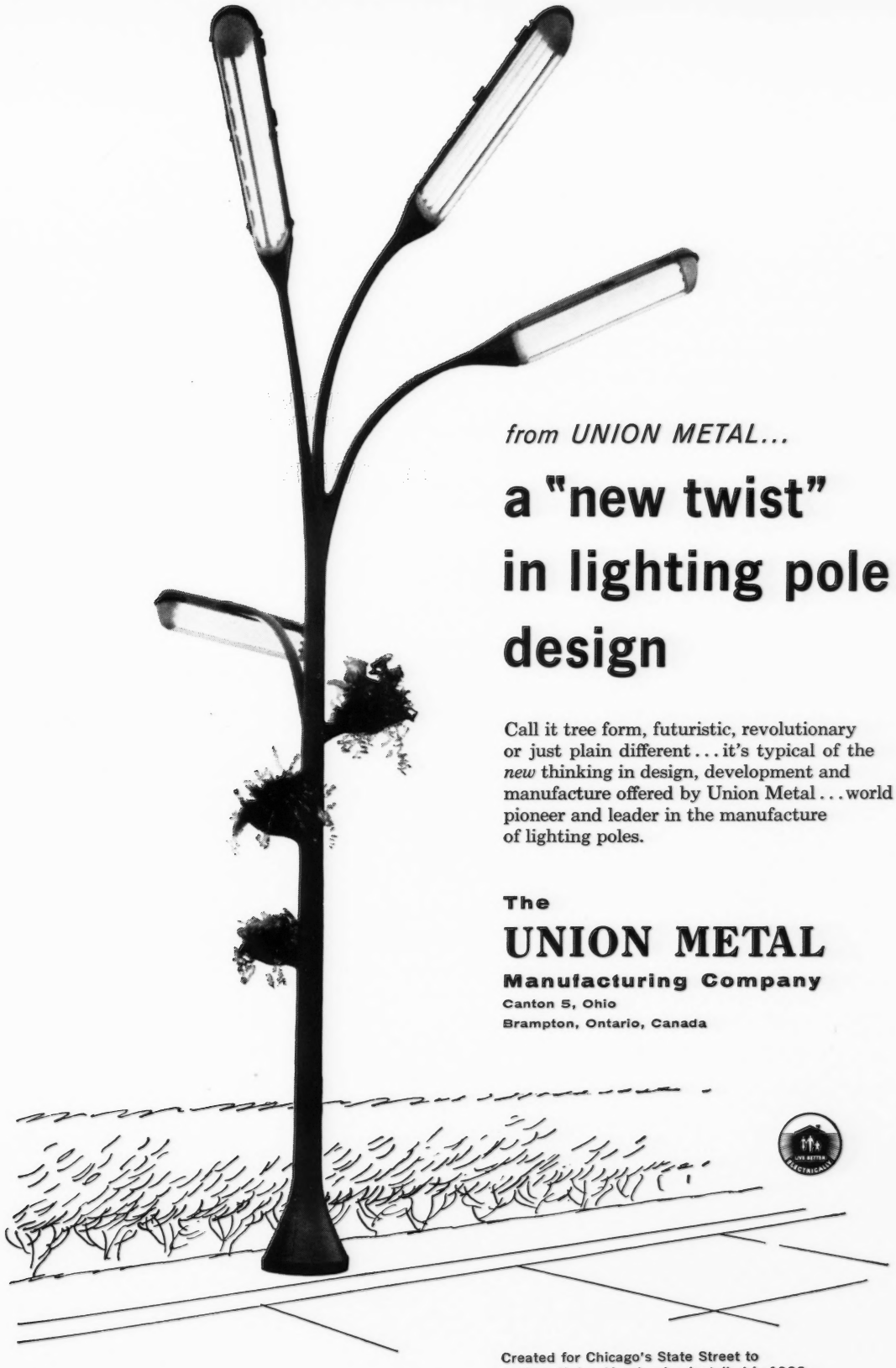

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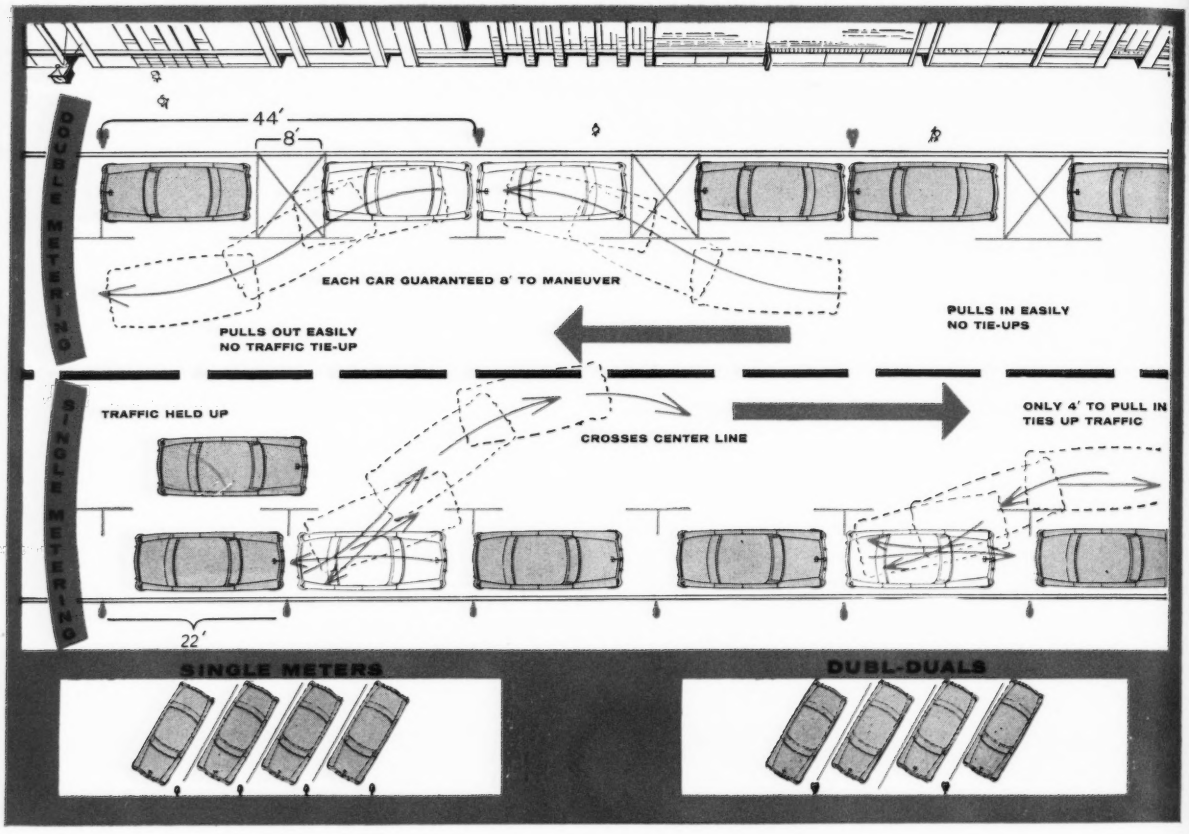

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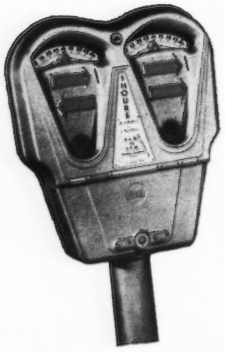

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TRAFFIC ENGINEERING

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Cover: The Greater New Orleans Bridge, recently opened, is reported to be the longest cantilever highway span in the world.
—Photo Courtesy of Aluminum Company of America

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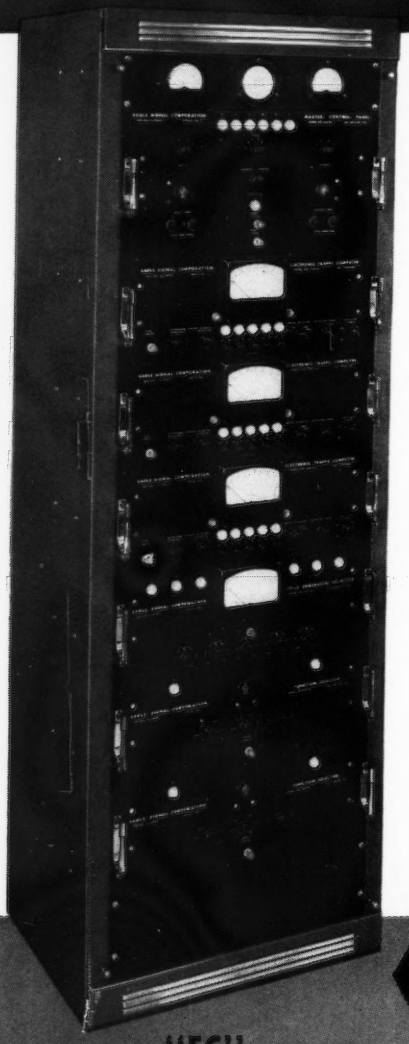
from EAGLE



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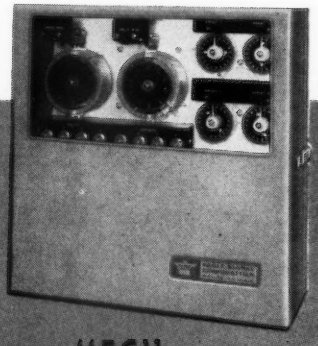

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Frankly Speaking . . .

IT HAS BEEN GENERALLY RECOGNIZED by the officers and members of the Board and the Technical Council of the Institute that the committee structure under the Council has not produced satisfactory results in the past few years. This has led to a study of the Technical Council operation which was thoroughly discussed at the Miami meeting. This resulted in a proposal to reorganize the Technical Council.

It was agreed that the present departments, each with a specific scope, should be retained. It was suggested, however, that the department head should be aided by a committee which would act as an executive or steering committee for the department. This would be the department's only standing committee, whose members would act in an advisory capacity for the purpose of determining subjects for committee action. It would also serve as a review committee upon the completion of reports.

Accordingly, the Technical Council in session at the meeting in Miami Beach passed the following resolution:

> "It is the intent of the Technical Council to accomplish, as quickly as possible, the appointment of standing committees in each department, chaired by the respective department head, to direct the research activity in that department. Under each standing committee there shall be appointed no more than three project committees. Additional committees as required may be appointed only with special approval of the Technical Council. No committee shall have continuity for a period longer than one year."

The Council then reviewed the committees under each department, and discharged those that had completed a report or were not working on an active project. Only those committees that were active and who expected to complete a report during the next year were retained.

At the meeting of the Technical Council during the Highway Research Board meetings in January, each department head will be expected to present his committee structure for the coming year with project statements describing the activity of each committee.

A committee of the Council has been appointed to explore the need for changes in the Rules of Procedure of the Technical Council and will report at the January 1959 meeting. It is hoped, therefore, that after January the Technical Council will be streamlined, will be operating under revised rules, and will be in a better position to complete the publication of technical material and reports.

It was agreed that more use should be made of the Local Sections of the Institute in carrying on committee activities. Local Sections will be called upon to recommend committee personnel for specific projects and may in some cases be asked to carry on a complete committee activity within the Section.

Institute members who as former members of discharged committees are anxious to participate in a particular project committee should communicate with the Local Section officers or a department head of the Technical Council as soon as the new project committees are announced. No member should apply for committee membership unless he is willing to participate actively in the work of the committee.

This is a major undertaking, and one which we hope will succeed in revitalizing the technical program of the Institute. We will be grateful for your patience during the transition period and then for your help in the new operation as it begins to roll.

A. F. MALO
Vice President
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Traffic Engineering in Tomorrow's Transportation

by D. Grant Mickle
(Mem., ITE)
Director, Traffic Engineering Division
Automotive Safety Foundation
Washington, D. C.

This paper was presented in response to the 1958 Theodore M. Matson Memorial Award at the Twenty-eight Annual Meeting of the Institute of Traffic Engineers, Miami Beach, Florida, November 11, 1958.

IT IS WITH GRATITUDE and a deep sense of obligation that I accept this Theodore M. Matson Award. Seldom, if ever, does a man earn recognition of this type solely by his own efforts. Whatever professional stature he may attain is due in large part to the help of many people and, so in accepting this honor, I want to pay tribute to the generous, able colleagues with whom I have been associated throughout the years in many parts of the country.

That the major professional honor in the traffic engineering field should memorialize the pioneering efforts and leadership of Ted Matson is eminently fitting and proper. His wise teaching and counsel probably have touched more practicing traffic engineers than the influence of any other man. Although I was not privileged to have the benefit of his formal teaching, I can say that it was a work of his that gave me my first insight into practical traffic engineering problems. In the summer of 1930, as I prepared to go to Harvard for graduate study, a notice arrived that an analysis on traffic problems in Kansas City, Missouri was available at a cost of $5. That resulted in my first investment in knowledge in this field — a book whose principal author was Theodore M. Matson, Chief Engineer of the Kansas City Study. From that time on, throughout his life, he continued to lead, in thought and action, in his chosen profession, and the discussion of the achievements of the traffic engineering profession cannot but shed new luster on Ted Matson's memory.

It was in the late 1920's and early '30's that a small group of imaginative and sometimes brash young engineers, including Matson, saw the need to apply technical training to the growing operational problems of automotive transportation. Their resourcefulness and enthusiasm formed the basis for the science of traffic engineering as we know it today. Had these men, and the ones who followed, not developed the workable techniques that they did, we could not possibly accommodate today's vast volumes of traffic on an antiquated, obsolete street and highway system. In fact, it is quite likely that the giant automotive industry itself would have failed to grow as rapidly, had not the operational improvements been made to step up roadway capacities as production increased.

Today we accept as commonplace and indispensable the application of one-way street operation, coordinated traffic signal systems, off-center lane control, restriction of curb parking, prohibition of turns, pedestrian controls and numerous other traffic engineering measures. Yet all of these techniques had to be devised and proven by Matson and the other pioneers of our profession.

It is now generally recognized that achievements in our field have been important and far-reaching. And traffic engineering literature documents the great public benefits that have resulted from this work. Therefore it is needless to review it here. Let us more profitably look at the problems that lie ahead and what they pose in the way of challenge to the traffic engineer.

Expressway Operation

The expanding highway program is one great area of challenge. This program of transportation improvement is as exciting in its scope and vital in its impact as the nation-wide development of our railroad system was in its day. Its influence may affect our economy and land uses just as tremendously. And the traffic engineer has an important part to play in this giant task of modernizing the nation's roads and streets.

For example, it is the responsibility of the traffic engineer to supply accurate and current information on traffic volume and travel desires, so as to insure adequate capacity, proper placement of interchanges and the most desirable highway locations for maximum service. He must forecast trends and project future traffic demands. He must predict motorists' habits and evaluate driving characteristics. He must assess the needs of motorists for services. Most of this information is passed on to the locating and design engineers, but when the new facility is completed the traffic engineer must be prepared to take it over and operate it efficiently and safely to the maximum advantage of the users.

Because modern controlled access roads and streets eliminate or obscure the usual landmarks and because generally higher operating speeds demand faster decisions on the part of the driver, the guidance and direction of traffic becomes more complicated while at the same time requiring far more precision.

Present standards do not contemplate the location of service areas within the rights-of-way of the Interstate highway network. A means of adequately advising motorists about availability of food, lodging, fuel, and repairs must be developed. It is up to

the operations official to devise ways to communicate such information.

The marvels of electronics offer great potential for making driving on modern expressways safer and more relaxing. Application of these techniques to vehicle signals and controls to aid the driver and as traffic control devices to facilitate the traffic flow are areas wide open for exploration by both the traffic engineer and the vehicle designer.

Increasing Efficiency of Existing Facilities

Another area of major challenge is in making the existing highway transportation plant operate more efficiently. The vast majority of the vehicle-miles of travel will still be rolled up on the existing facilities. There is little opportunity in cities to expand the mileage of present streets, yet our economy and population will continue to grow. More cars and trucks will be forced to use these existing facilities and the contrast between the freedom encountered on the expressways and the frustrations of surface travel will be further accentuated.

But we don't have to put up with the low efficiency of the average outdated facility. The traffic engineer knows that much can be done to raise the service and safety level of existing streets. He needs public support and understanding to back him up on his proposals to create more one-way streets, eliminate curb parking or invest sufficient funds for modern traffic control systems.

Electronics open up new frontiers in this area, too. There are real opportunities to improve and devise control systems that measure densities, relate them to capacity and automatically adjust signal timing or route traffic for optimum street use. Television surveillance of the system to pinpoint accidents or detect congestion so that prompt action can be taken is another already-being-tested possibility. Parking structures integrated with expressways and interchanges, with automatic guidance to available spaces are entirely feasible. Improvement of mass transit service based on imaginative concepts of service and equipment certainly merits professional attention.

All of these things require a bold approach and will cost money. Yet, if we demonstrate their feasibility and worth, the public will accept the cost in return for improved transportation service.

Research

A third area of challenge is research. Most traffic engineers are so busy with the daily job of operating the street and highway system that they find little time to devote to imaginative thinking, and even less to conduct research. Yet the answers to many current and future problems lie waiting to be discovered in studies thus far neglected.

We need to know more about why people choose various forms of transportation. What is the relationship between the economic base of a community, its social and cultural activities and the kind and extent of its transportation requirements? What is the practicable and desired ratio of mass transportation service and individual transportation? How can we develop and use electronic computors and simulators to pre-test various traffic system concepts and control schemes? What is the proper ratio of mileage of expressways, arterials, and parking spaces for various sized cities?

These are merely samples of the kind of traffic engineering questions that need answers. The search for more knowledge should be never-ending. To expand this endeavor, closer working relations might well be developed between universities and public officials, to the benefit of both. Researchers on university campuses working with students and/or field staffs of city or state traffic agencies could gain useful practical experience while making significant contributions to the fund of knowledge. Conversely, the public official would gain valuable new findings and his staff's knowledge and interest would be broadened from the research experience of the university people. Similar cooperative research can be carried on through joint efforts of automotive industry researchers and traffic operational specialists.

Administration

Time has demonstrated the truth of an early Matson maxim, that the fruits of the traffic engineers' knowledge and efforts cannot fully mature unless the climate is right. One essential of a good climate is a proper administrative structure that provides adequate authority and responsibility for the overall transportation job, whether in a city or state.

The administrative structure must recognize and embrace all elements of modern highway transportation management and provide for the smooth teamwork of all essential functions. The traffic engineer is one member of the team.

The basic functions of transportation management can be expressed in six or seven general categories: (1) Planning, (2) Design, (3) Construction, (4) Operations, (5) Maintenance, (6) Inventory and Records, and in cities (7) Public Transportation. In some of these the traffic engineer has major responsibility; in others his role may be only advisory. In any case, he is interested in seeing that all the basic functions are adequately performed.

Transportation Planning includes the collection and analysis of data to evaluate transportation service now being provided and to determine deficiencies. It entails programming of transportation improvements and the determination of priorities. To be effective, it requires coordination and cooperation with the development of other physical improvements such as recreation and commercial centers, housing developments, and parks. Planning provides the administrative head with advisory service on policy and makes it possible to keep tabs on progress of the various programs underway. Certainly, the traffic engineer is qualified in this field.

Design. The designer gives physical dimensions to the plans. He develops general standards and design criteria and prepares construction plans. His standards must reflect knowledge of driver and vehicle characteristics as well as physical properties of materials. Data from many sources, including information derived from the planning, operations, and survey functions, carried on by traffic engineers, are essential to the designer.

Construction gives physical reality to plans and designs and is closely related to design. This function may include actual construction or it may be limited to the supervision and inspection of contract work. This is not the traffic engineer's work, but he is obviously concerned as operations are affected.

Operations. As has been indicated, the operation and control of streets or highways, so as to produce optimum transportation service with a minimum of accidents and inconvenience, is a major responsibility of the traffic engineer. This function embraces the preparation of operational plans and programs—more and more on a system

basis, the development and use of traffice control devices, preparation of traffic and accident studies, control and regulation of parking and curb openings, traffic routing and issuance of permits for special uses that affect efficient or safe traffic flow. Obviously, there is close relationship between operation functions and those of planning and design.

Maintenance. The objective of maintenance is to keep the various components of the street or highway system in serviceable condition and to protect the public's investment in its roadway plant through regular inspection, preventative and corrective maintenance. Again, the traffic engineer is concerned, not directly, but rather as the level of maintenance affects operations.

Inventories and Records. Records of the physical dimensions and conditions of the roadway plant are a necessary part of street and highway management. Because of certain legal requirements, a record of the location and condition of traffic control devices must be kept up-to-date. Maps, survey notes, and other data are all essential to an adequate fulfillment of this function.

Public Transportation. Recognizing that the public interest is best served when all elements of the city's transportation program are reasonably balanced and coordinated, the community must develop sound policies on public transportation. Such policies can be formulated only on the basis of pertinent data assembled through competent, long-range planning by traffic management. Akin to this are the regulatory functions, such as granting of permits to operate public vehicles and the establishment of rules for the use of city streets. Increasingly, this task is falling to the traffic engineer as the best-qualified member of the transportation management team.

By and large, the quality of traffic engineering performance will depend, first, on whether his operation functions are properly positioned in the general structure of government; and second, whether they are properly keyed to the other aspects of street or highway transportation management.

Organization

To effectively relate these functions within a complicated governmental organization, we need guideposts to chart our actions. Detailed studies of numerous state and city traffic engineering organizations have been conducted, and these have made an outstanding contribution in that they have developed such guideposts in the form of basic criteria of good organization. Briefly, these are:

1. Related functions should be consolidated so that each unit of the organization is made responsible for a logical, clearly defined, separable function or group of functions.

2. Interdependent functions should be assigned to units reporting to the same supervisor at the next higher level of authority.

3. Each essential function should be assigned definitely to a single unit and accomplished by a single chain of command and accountability.

4. The rank of each unit should be based on the relative importance of its functions.

5. Each unit should have sufficient authority and resources to carry out its assigned responsibilities and should be required to make, and stand accountable for, all decisions within the scope of its authority.

6. The distinction between policy and technical decisions should be kept clear and each decision should be executed at its proper level.

7. Objective, duties, scope of responsibility, and limits of authority of each unit should be stated plainly in writing and accepted universally throughout the organization.

Applying these criteria to the typical state and city organizations, I see quite different problems. At the state level the consolidation of functions within a single purpose highway department is the rule. The traffic engineer is making his contribution. Does he, however, have adequate authority, clearly stated, to carry out the operational functions. This paper earlier pointed out the new areas of operations which accompany controlled access. Clear assignment of the operational responsibilities and definition of traffic engineering functions are clearly called for. In recognition of these new conditions a special committee for the Traffic Committee of AASHO is about to report on three years of study on the functions and administration of traffic engineering in the state highway departments. It is hoped that this will lead to an AASHO statement of policy on this important matter. If this is done, the role of the traffic engineer in the state government will be definitively established for the first time.

In urban areas at present, the role of the traffic engineer may vary from that of advisory in the Police Department to cabinet officer under the Mayor or City Manager. Logic would seem to dictate that if the criteria and functions just described are to be effectively carried out, the traffic engineer's functions should be consolidated with related activities in a Department of Street Transportation. With the creation of such a Department in city government, proper coordination of all street and traffic functions can be effected on a permanent basis. This approach also affords the traffic engineer the opportunity to move into broader fields of endeavor and not become confined to a narrow groove characterized by signs, signals, and markings. The traffic engineer can be vastly more effective in urban transportation planning and design than is now typically the case.

Challenge and Opportunity

Traffic engineering, after more than thirty years of development and growth, has won public acceptance and recognition of its importance as an essential technique of highway transportation. During this period, when little was being done in the construction of new facilities, particularly in urban areas, traffic engineering carried the load. Perhaps it is not too much to say that most of the increase in street capacity in the past three decades has been accomplished almost solely with traffic engineering measures.

Now, with the new highway construction program, problems are developing and new frontiers are opening—not only for the highway builder but for the traffic engineer as well. Effective as the traffic engineer's efforts have been in the past, we have only scratched the surface of what can and must be done.

For those of us who have chosen this phase of engineering, there is a continuing and expanding responsibility and opportunity. We have the responsibility to carry forward our profession by developing new methods and techniques, to apply this knowledge for the benefit of the highway user and the community, and to insure maximum efficiency and safety from transportation facilities.

Our opportunity lies in the contribution we can make through the use of traffic engineering knowledge to: (1)

(Continued on page 32)

The 1958 Past Presidents' Award Paper —

Vehicle Speeds and Volumes Using Sonne Stereo Continuous Strip Photography

by Martin Wohl
(Jun. Mem., ITE)
Instructor in Civil Engineering
Department of Civil and Sanitary Engineering
Massachusetts Institute of Technology

Synopsis

This paper suggests some applications of continuous strip stereoscopic photography to the field of traffic engineering, and develops formulas for determining speeds and volumes from this type of photography. It is suggested that strip photos may serve as a faster and more accurate device for gathering certain data necessary in the transportation design process.

It is felt that use of these methods might eventually provide a system of obtaining both basic speed and volume data simultaneously and of gathering these data for an entire downtown area in the period of one hour. It is also conceivable that data gathered by this technique could be processed automatically, and used as direct input for a series of electronic computer programs.

Introduction

Design speeds and volumes are certainly of utmost importance to the designer of highway facilities. These design data depend heavily on present-day vehicular speeds and volumes recorded on our streets and routes. Consequently it is necessary that these collected data be representative, accurate, and as current as possible.

Volume and speed data are usually obtained by some form of manual or mechanical field testing. All of the current methods have been unsatisfactory for one or more of the following reasons:

A) The data collection process is time-consuming.
B) Large personnel requirements are necessary.
C) The collection process for a metropolitan area often must be conducted over a period of months, or throughout a full year.
D) Adjustment of basic data to common base (such as AADT) is difficult and inaccurate; in most cases this step is necessary only because the data have been collected at different times.
E) Additional errors occur in the field counting or testing.
F) The expense is high.
G) Speed and volume data are usually collected and processed separately.

Numerous attempts have been made to eliminate these disadvantages, but two general techniques have received more attention than others. One technique utilizes the moving vehicle method for estimating traffic volumes and speeds, and the other uses photographs.

The moving vehicle method, though extremely simple, still requires more than an "optimum" length of time to collect data, and has not been successful in all cases. The Cook County study[1] in part said, "If a large number of sections are to be sampled, with the idea of estimating the total combined volume of all sections, the method appears to be very useful, for while in any single section there may be a sizable error, these errors appear to cancel out when sections are combined." (This study, however, tested the method only for the five off-peak hours from 10 a.m. to 3 p.m.) Other reports have indicated a varying degree of accuracy and usefulness in establishing speed-volume relationships.[2]

The photographic methods which are most common utilize time-lapse or serial pictures taken by a movie camera from some building (or vantage point). These pictures yield large quantities of useful data, but are extremely difficult to assemble and analyze. As the size of the area being surveyed becomes larger, the task of processing the data becomes insurmountable.

The Basic Problem

It would be desirable to develop a method by which we could sample the traffic, obtain accurate volumes and speeds, use only one data collection process, and minimize time and effort. It is also important that such a method will allow us to collect *all* the data for a given study area during the *same* period of time.

Solution Using Aerial Photography

Aerial photography has always seemed to offer many advantages in the collection of traffic data. The flight height makes it possible to photograph a large area at one time, and the plane speed enables us to gather even larger quantities of data over short periods of time. If two aerial photos are taken at different times (a stereo-pair) and both photos include the same moving vehicles, it is possible to obtain vehicle speeds, volumes, etc. in the same manner as that used for several pictures taken with a movie camera. However, the same data reduction problem exists as with serial pictures. Also, the views of the vehicular traffic are often obscured by shadows and by buildings on either side of the plane's vertical axis.

A more recent development in aerial photography, Continuous Strip Stereoscopic Photography, enables us to retain most of the advantages mentioned before and in addition to eliminate the problem of assimilating separate

1 William J. Mortimer, "Moving Vehicle Method of Estimating Traffic Volumes and Speeds," Bulletin 156, Highway Research Board.
2 R. C. Blensly, "Moving Vehicle Method of Estimating Traffic Volumes," *Traffic Engineering*, December 1956. See also Louis E. Keefer, "The Relation Between Speed and Volume on Urban Streets," paper presented at the 37th Annual Meeting of the Highway Research Board, January 1958.

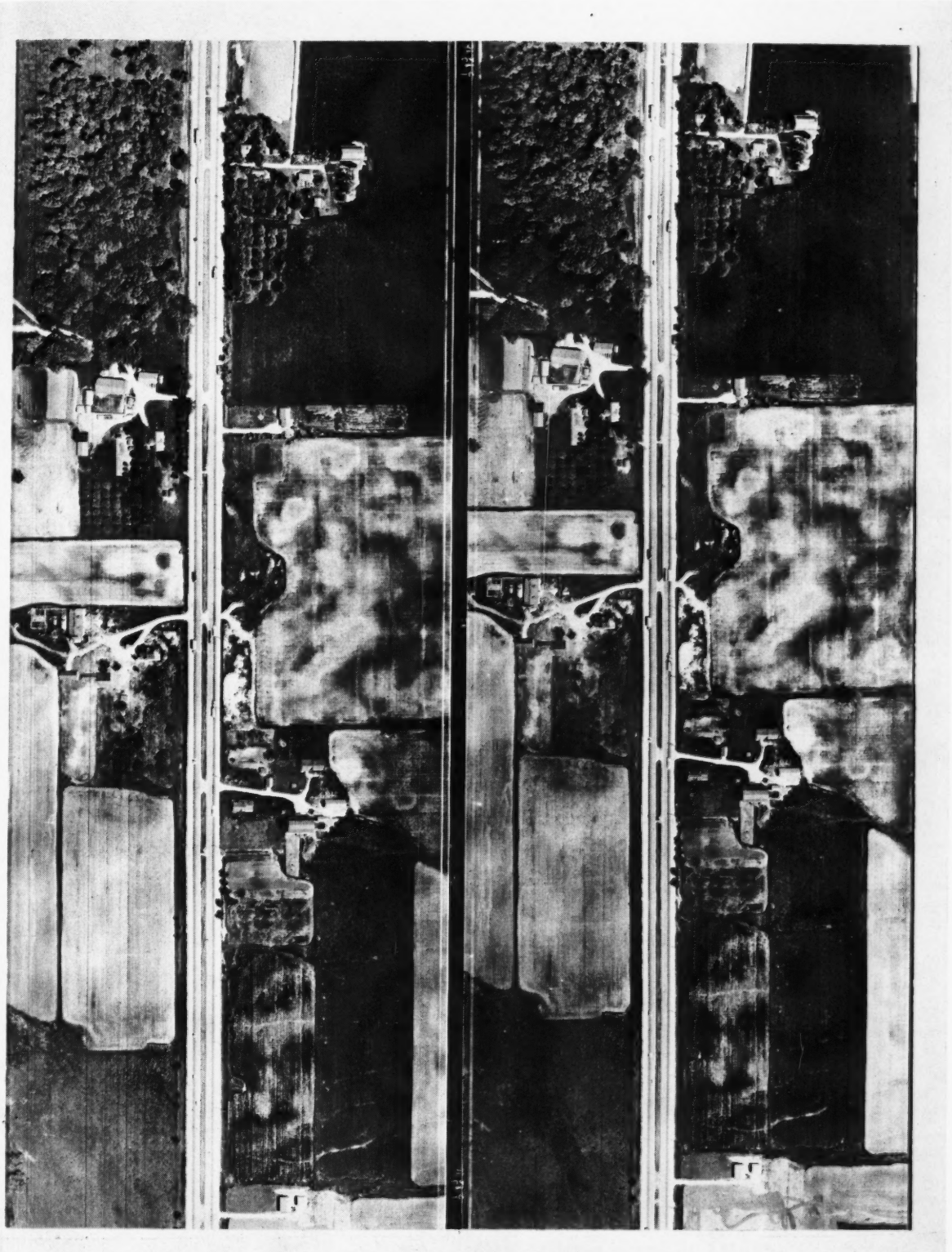
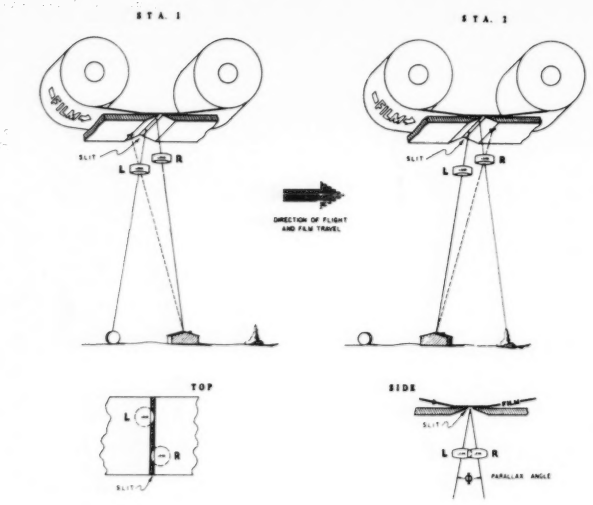


Figure 1

Sonne Continuous Strip Stereoscopic Photography (reduced from 9½" negative width) Flight height = 1000 feet; Focal length = 4 inches; Parallax angle = 5 degrees.



PLAN AND SIDE VIEWS OF THE SONNE CAMERA (WITH STEREO LENSES)

FIGURE 2

photographs. Figure 1 is an illustration of this type photography, in which the two adjacent strips serve to provide the stereo effect. At a scale of 100 feet per inch of film, approximately 90 miles of highway can be shown as one *continuous* and unbroken photograph.

More important, it is possible to obtain a continuous strip photograph of approximately 136 miles *in one hour*. This strip would represent linear coverage of every street of a four square mile downtown area with 300-foot blocks.

Description of Sonne Continuous Strip Stereo Camera

Plan and elevation views of the Sonne camera are shown on Figure 2. The equipment consists of an aerial camera in which the film being exposed is continuously moved past a narrow slit-type aperture. The film velocity is based upon the ground speed of the plane and its height above the ground. The film and image velocities are synchronized so that little or no image blur occurs and so that each point along the ground is photographed as the line-of-sight passed over it.

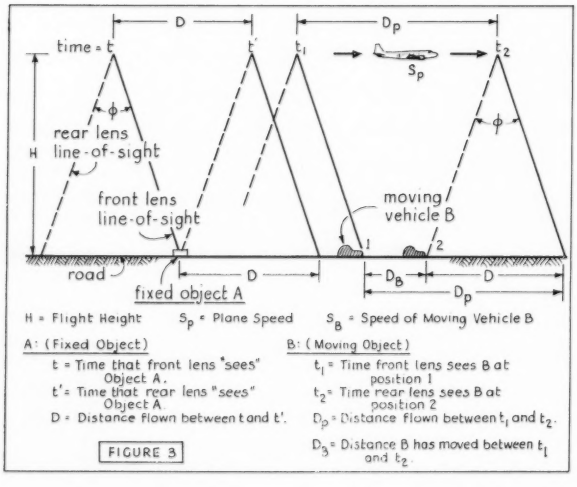


FIGURE 3

The camera includes two matched lenses, with the right lens ahead of the slit and the left lens to the rear. Each lens while photographing ground objects continuously exposes only *half* of the film width; the right lens "sees" an object before the plane passes over it, and the left lens after the plane passes over it.

Time-Lag Between Front and Rear Pictures

For illustrative purposes, assume that we have two lines-of-sight, one forward and the other rearward. Figure 3 shows the lines-of-sight of the two lenses at four instants of time (t, t', t_1 and t_2) during the flight.

The parallax angle ϕ between the two lines-of-sight can be considered to represent an interval of time, or airbase time-lag. To show this, examine the portion of Figure 3 from time t to t'. At time t, the front lens records fixed object A. The rear lens sees the same object some time later, or at time t'. During this interval of time $(t' - t)$, the plane has flown a distance D, which is equal to the ground distance between the ends of the front and rear lines-of-sight at one instant of time. The distance D, commonly called the airbase, can be calculated as follows:

$$\tan \phi/2 = \frac{D}{2H}$$

$$D = 2H \tan \phi/2 \qquad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where D = Airbase
H = Flight height
ϕ = Parallax angle

Let S_p = Plane speed

$$\therefore D = S_p (t' - t), \text{ or } (t' - t) = \frac{D}{S_p}$$

and

$$(t' - t) = \frac{2H \tan \phi/2}{S_p} \qquad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where $(t' - t)$ is the *airbase time-lag*.

For any strip, the parallax angle ϕ is fixed. If the flight height and plane speed remain relatively "constant," the airbase and its time lag $(t' - t)$ would also be constant and can be found from formulas (1) and (2).

Moving Vehicle Speed Determination

Again referring to Figure 3, examine the plane positions at time t_1 and t_2. At time t_1 the front lens records moving vehicle B at position 1. At time t_2 the rear lens finally sees moving vehicle B which has moved to position 2. (Realize, though, that vehicle B at time t_1 is recorded by the front lens on the right half of the strip and at time t_2 it is recorded by the rear lens on the left half, as shown on Figure 4.) In the interval of time $(t_2 - t_1)$, the plane has flown a distance D_p while vehicle B has moved a distance D_B. The distance the vehicle B moves (D_B) can be expressed as a function of its speed (S_B) and time of movement:

$$D_B = S_B (t_2 - t_1)$$

The vehicle speed then becomes

$$S_B = \frac{D_B}{(t_2 - t_1)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

The time interval $(t_2 - t_1)$ can not be determined directly from the photos, but can be expressed as follows:

$$D_p = D_B + D = (S_p)(t_2 - t_1)$$

$$\therefore (t_2 - t_1) = \frac{D_B + D}{S_p}$$

This time interval $(t_2 - t_1)$ can then be substituted in expression (3).

$$\therefore \quad \boxed{S_B = \frac{D_B}{(t_2 - t_1)} = S_p \frac{D_B}{D_B + D}} \quad * \quad \ldots\ldots (4)$$

It is apparent from formula (4) that moving vehicle speed is a function of plane speed (S_p), airbase (D), and the distance (D_B) a vehicle moves during the airbase time-lag $(t_2 - t_1)$, which is the interval between being photographed by the front and rear lenses. The plane speed and airbase are relatively constant and must be calculated and only once for a strip. The airbase (D) may be calculated using formula (1), or may be measured directly from the strip-photo as indicated in Figure 4. Similarly, the expression $(D_B + D)$ may be measured directly from the photo.

This method of calculating moving vehicle speed can be used regardless of the relative direction of the plane and vehicles if certain factors are considered. In formulas (3) and (4) the Distance D_B takes a *negative* sign when the direction of the plane and moving vehicle are *opposite*. If the movements of the plane and car are exactly perpendicular (or crossing), the speed (S_B) of the moving vehicle is:

$$S_B = \frac{D_B}{(t' - t)} = S_p \left(\frac{D_B}{D}\right)$$

However, if the relative direction of the plane and moving vehicle is "skewed," this must be taken into account with a cosine function.

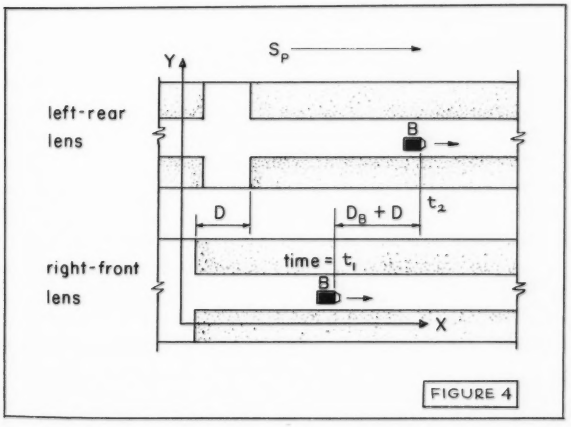


FIGURE 4

Vehicle Speed Error Analysis

An error analysis has shown that the per cent of error in vehicle speed determination (S_B) varies directly with the per cent of error in the plane speed (S_p) and in the measurement of car movement (D_B). An approximate relationship can be expressed as follows:

$$\frac{\Delta S_B}{S_B} \approx \frac{\Delta S_p}{S_p} + \frac{\Delta D_B}{D_B}$$

where Δ (—) is the increment of error.

Various Approaches to Vehicular Volume Determination

Volume is normally determined by counting the number of vehicles that pass a given "point" during a unit of time. This volume is a function of density and the average overall speed of the vehicles, and directly proportional to both variables.

Another way to obtain the volume might be to "stop" all the vehicles on a route at the one instant of time (such as in a normal aerial photograph), move a "point" past them and count the number of cars passed; if the "point" is moved past the vehicles at a known speed, the volume can be determined as a function of this speed and the numbers of vehicles passed over. However, if this "moving point" speed is greater or less than that at which the vehicles normally move past a fixed point, the resultant volume will be greater or less than the true volume.

Continuous strip photography is, for all practical purposes, a picture taken by a "point" moving past our vehicles. The speed of this "moving point" is the plane speed. Therefore, a volume developed from strip photography using the "moving point" analogy must take into account the speed at which the point passes the cars; also, since the picture is taken as the point moves along the route, the distance bewteen the end vehicles is greater (if the plane and cars are moving in the same direction) than if all the vehicles were "stopped" at the same time.

Development of Formulas for Determining Volume from Strip Photography

Figure 5 represents one-half of a continuous strip. The two vehicles D and A were recorded at times t_D and t_A; the section between these two times shows everything the lens has "seen" during that interval and over the distance

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* Mr. Daniel R. Schurz, Instructor in Photogrammetry at M.I.T., developed a method of measuring moving vehicle speed using a comparator attachment on the Sonne Stereo-Viewer. The formula for speed is:

$$S_B = \frac{S_p (\Delta p)}{(\Delta p + D)}$$

where Δp is parallax difference of auto and road.

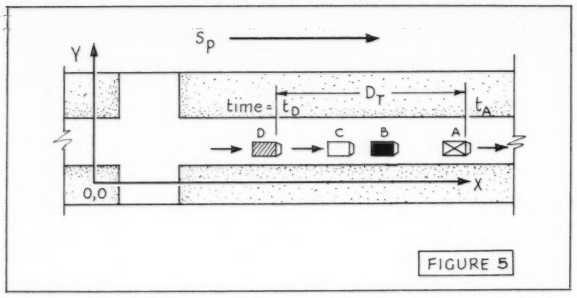


FIGURE 5

D_T. The Plane speed, S_p is known, and the distance D_T can be scaled directly from the photo.

$$\therefore\ D_T = S_p\,(t_A - t_D)$$

$$\text{and}\ (t_A - t_D) = \frac{D_T}{S_p}$$

From D to A, the "moving point" (or plane) passed over n vehicles (n includes both end vehicles) in the time interval $(t_A - t_D)$. Since volume is vehicles per unit time:

$$\text{Moving Point Volume} = \frac{(n-1)}{(t_A - t_D)} = \frac{(n-1)S_p}{D_T}$$

However, either the interval $(t_A - t_D)$ or D_T must be corrected since the "moving point" did not pass over all the vehicles at *exactly* the same instant of time, and since vehicle D (as well as C and B) has moved since time t_D.

Therefore:

$$\textit{Corrected}\ \text{Moving Point Volume} = \frac{(n-1)\,S_p}{D_{T'}} \quad \ldots (5)$$

where $D_{T'}$ would be the distance between end vehicles D and A if they were photographed at the *same* instant of time.

$D_{T'}$ is equal to the distance D_T minus the distance the last vehicle D has moved in the interval $(t_A - t_D)$:

$$D_{T'} = D_T - S_D\,(t_A - t_D) = D_T - S_D\,\frac{D_T}{S_p}$$

$$\text{and}\ D_{T'} = \frac{D_T}{S_p}\,(S_p - S_D)\ * \quad \ldots\ldots (6)$$

where S_D = Speed of Vehicle D.

Substituting formula (6) into (5):

$$\textit{Corrected}\ \text{Moving Point Volume} = \frac{(n-1)(S_p)^2}{(S_p - S_D)(D_T)} \quad (7)$$

Earlier it was mentioned that a volume based on the "moving point" would be correct *only* if the vehicles were "stopped" at the same instant of time [this has been taken into account in formula (7) by a correction] *and* if the "moving point" or plane speed were equal to that of the moving vehicles. Both of these conditions will be satisfied if the speed differential is taken into account as follows:

Let V = Actual Vehicular Volume in Vehicles per unit time

$\bar{S}$ = Average Overall Speed of n vehicles

Then, V = *Corrected* Moving Point Volume $\times \frac{\bar{S}}{S_p}$

$$\therefore\ \boxed{V = \frac{\bar{S}\,(n-1)S_p}{D_T\,S_p - S_D)}} \quad \ldots\ldots\ldots\ldots (8)$$

It is apparent that a volume developed using continuous strip photography is dependent upon five factors.

$\bar{S}$ — Average Overall Speed of the group of vehicles

S_p — Plane Speed

S_D — Speed of the last vehicle in line

D_T — Distance (scaled from photo) between first and last vehicle

n — Number of vehicles in line (including both end vehicles)

S_p is known, D_T and n can be obtained directly from the strip, while $\bar{S}$ and S_D can be calculated by using the vehicle speed formula (4). ($\bar{S}$ would be an arithmetic average of the individual speeds of the vehicles in the group.)

Size of Sample to Be Taken for Volume Determination

At this time the length of the sample that must be taken to insure a representative and reliable volume determination is not known.

However, there is one important difference between the samples obtained by this method and those presently used. A smaller sample can be taken if the strip photo volume method is used.

Assume a plane speed of 120 mph, an average overall moving vehicle speed of 30 mph, and a route length of 20 miles. The plane could then travel from end to end in only 10 minutes, while a car would require 40 minutes to make the same trip. Under the assumed conditions, a *15 minute* strip photo sample would contain vehicular speed and volume data that would require *an hour* to gather by standard practices. As the relative speed between the plane and moving vehicles increases, the strip photo sample probably can be reduced proportionally.

Other Applications of Continuous Strip Photography

Earlier sections of this paper summarized possible methods of determining vehicular speeds and volumes from

* If the plane and vehicles are moving in *opposite* directions, the minus sign becomes a plus.

strip photography. The traffic engineer usually finds it necessary to obtain other data, such as time and distance spacing between vehicles, lateral placement of vehicles, or accumulation of vehicles in a downtown area, for example.

Formula (6) gives the actual distance spacing $D_{T'}$ for any two vehicles, such as D and A (Figure 5):

$$D_{T'} = \frac{D_T}{S_p} - (S_p - S_D)$$

where D_T is the scaled distance between the two vehicles

S_D is the speed of Vehicle D (or the last car in line)

S_p is the plane speed

If the two cars (D and A) are moving at the same[1] speed S, the actual time spacing T_S is:

$$T_S = (t_A - t_D)\frac{S_p}{S} - (t_A - t_D) =$$

$$(t_A - t_D)\left(\frac{S_p - S}{S}\right)$$

$$\therefore \quad \boxed{T_S = \frac{D_T}{S_p}\left(\frac{S_p - S}{S}\right)} \qquad \ldots\ldots\ldots\ldots (9)$$

Time and distance spacing data obtained in this manner could be of great value to future research studies concerned with theoretical aspects of traffic flow, or for measuring vehicle delay at an intersection or over a route.

In addition, information on lateral placement of vehicles, or on the accumulation of vehicles in an area can be obtained directly from the strip photos. In the latter case, the number of moving and parked vehicles (excluding those in off-street facilities) can be determined by counting the total number of each type on the streets covered.

Similarly, it may be possible to determine curb parking turnover rates by using strip-photography. To illustrate this, assume the scale of the (available) photography is one inch to 250′ (1″ = 250′). Then, if photo distances of 0.001″ could be measured accurately, it would be possible to measure a ground displacement of three inches (3″) or more. Consequently, if one car left its curb space (or if the space were vacant), and if another car parked in its place but at least 3″ out-of-line or position (relative to the first car), the parking space turnover for the interval could be determined. Obviously the success of such a method depends on the accuracy and "speed" of the measurement devices used and on the degree to which successively parked vehicles tend to be parked in different positions.

Processing of Strip-Photography Data

The speed and volume formulas were expressed as a function of a number of variables. Closer examination will show their dependence on:

1) "Constants" for the continuous strip:
   - S_p — Plane Speed
   - H — Flight Height
   - ϕ — Parallax Aangle
2) Data which must be obtained from the strip photo:
   - $\underline{n}$ — Number of Vehicles in Line
   - $\underline{D}_B$ — Distance Vehicle "B" Moves During Interval of Time Being Photographed Between Front and Rear Lenses
   - D_T — Scaled Distance Between First and Last Vehicle in Line

D_T would be scaled for each route length, or section of route; each vehicle would have to be counted to obtain $\underline{n}$; $\underline{D}_B$ must be determined for each vehicle.

If our speeds and volumes are to be calculated by the suggested methods, the success of such a system would depend to a great extent on the ease and speed with which the distance D_B can be determined. If an arbitrary set of X- and and Y-coordinates are set up for the stereo-strip photo, D and $D_B + D$ can be found by subtracting the X-coordinate of any vehicle in one half of the strip from the X-coordinate of the same vehicle in the other half. Similarly, D_T can be found by subtracting the X-coordinates of any two vehicles from each other (see Figures 4 and 5).

Such a set of X- and Y-coordinates could be drawn on the photo and the coordinates for each vehicle scaled directly from the strip. A more sophisticated approach to measuring these coordinates might include a scanning device to "locate" each vehicle and automatically determine and record (on cards or tape) the X- and Y-coordinates, direction of movement, position in line, etc. (A coordinatograph might serve as the basic framework for the instrumentation of a semi-automatic system.)

The output data from our scanning device could serve as the input data for a series of electronic computer programs designed to calculate vehicular speeds, volumes, distance spacing, etc. The output from these calculations then might serve as direct input for a block of traffic simulation programs which would evaluate either a particular intersection or a network of intersections in a downtown area.

Summary

Present methods of collecting and processing speed and volume data are slow, inaccurate, and expensive. However, it may be possible to obtain the same information faster and more accurately using continuous strip stereo photography.

If speeds and volumes are determined using strip photography, the time necessary to obtain the data for an entire downtown area might be reduced to an hour, thereby eliminating the need for constant adjustment of isolated counts to a common base, such as AADT, by using variation charts.

(Continued on page 49)

[1] If their speeds are not equal, formula (9) must be changed to account for the speed differential.

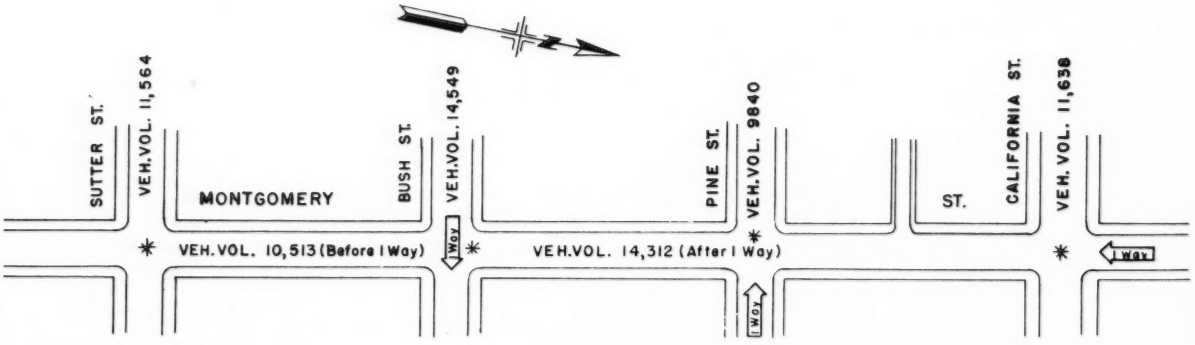
Exit 'Scramble' in San Francisco

by William Marconi
(Jun. Mem., ITE)
Assistant Traffic Engineer
City & County of San Francisco, California

SCRAMBLE in San Francisco is now history. On October 2, 1957, the all pedestrian phase or "scramble" was removed from four signalized intersections on Montgomery Street and it signified the end of two years of experience with this type of pedestrian control. The factor prompting removal was the immediate need for more capacity on Montgomery Street to handle diverted traffic from a new adjacent one-way street. "Before and after" studies were made which will be described later in this article. In summary, the studies show that in spite of a 33½% increase in traffic volumes, there was a 24% increase in traffic speeds and a 53% decrease in traffic delays when the "scramble" system was removed.

Location

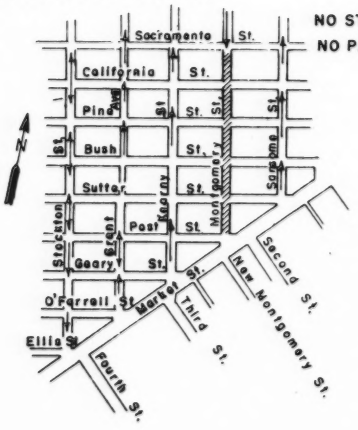
Plate 1 shows the location of and pertinent information regarding Montgomery Street, the site of the scramble signals. The street, 39 feet in width, carried approximately 10,500 vehicles per day. Being in the heart of San Francisco's financial district, it naturally had extremely heavy pedestrian volumes. The turning movements were also considerable. It was a two-way street with parking prohibitions on both sides of the street between 7:00 A.M. and 6:00 P.M. and towaway or "No Stopping" regulations on both sides in the morning and evening peak hours.



* Scramble controlled intersection.

PARKING RESTRICTIONS

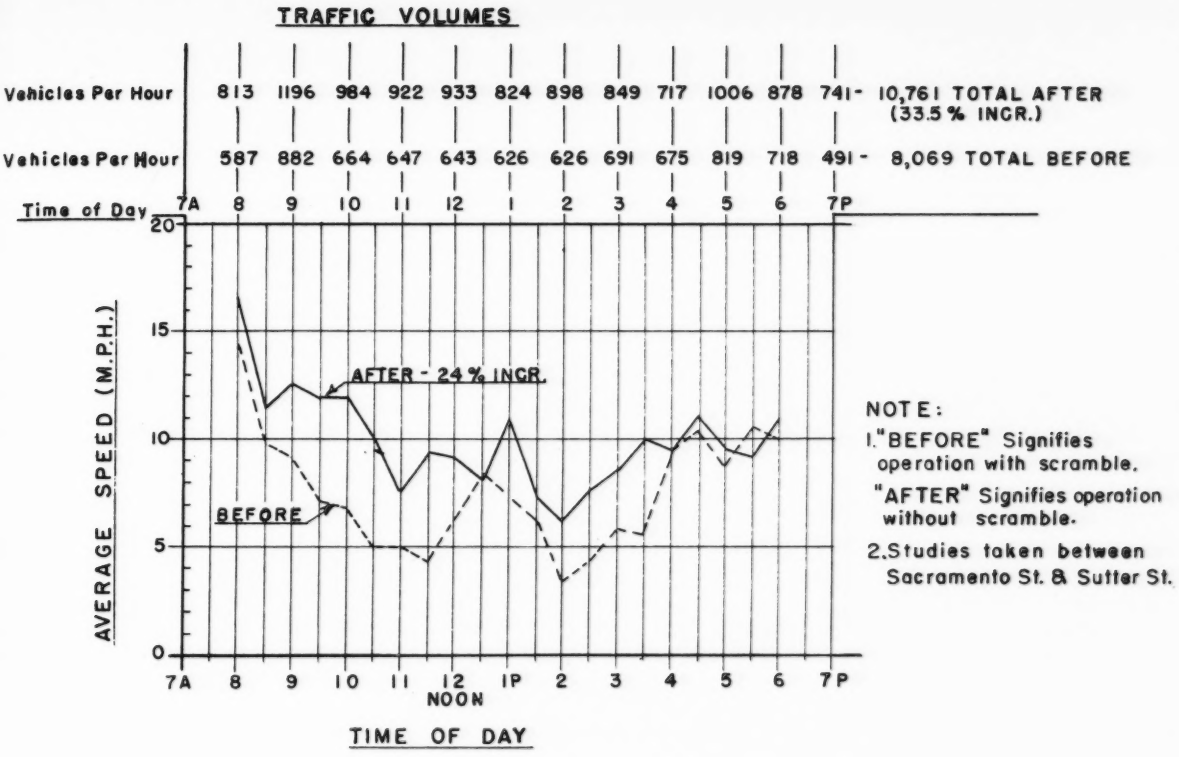
NO STOPPING 7A.M. TO 9A.M. & 4 P.M. TO 6 P.M. Both sides of Montgomery St.
NO PARKING 9AM TO 4PM Both sides of Montgomery St.



MONTGOMERY ST.

General Location, Traffic Volumes, Parking Regulations, & Location of Scramble Signals.

PLATE 1


TRAFFIC VOLUMES
Vehicles Per Hour 813 1196 984 922 933 824 898 849 717 1006 878 741- 10,761 TOTAL AFTER (33.5% INCR.)
Vehicles Per Hour 587 882 664 647 643 626 626 691 675 819 718 491- 8,069 TOTAL BEFORE
Time of Day 7A 8 9 10 11 12 1 2 3 4 5 6 7P
AVERAGE SPEED (M.P.H.)
20
15
10
5
0
AFTER - 24% INCR.
BEFORE
NOTE:
1."BEFORE" Signifies operation with scramble.
"AFTER" Signifies operation without scramble.
2.Studies taken between Sacramento St. & Sutter St.
7A 8 9 10 11 12 NOON 1P 2 3 4 5 6 7P
TIME OF DAY

BEFORE & AFTER TRAFFIC VOLUMES, & AVERAGE SPEEDS ON MONTGOMERY ST.

PLATE 2

Conditions that Prompted Scramble Removal

The increasing traffic volumes and traffic congestion in downtown San Francisco pointed out the need to make Kearny and Stockton Streets one way streets to obtain needed additional capacity. Kearny Street was made one way northbound and Stockton Street was made one way southbound. Because of topographical conditions and other local features, it was decided that Stockton Street could be counted upon to carry very little of the southbound traffic that used Kearny Street and the bulk of it would probably be diverted to Montgomery Street. Since congestion was already heavy on Montgomery Street, it was imperative to find some way of obtaining extra capacity on this roadway. In addition to general traffic, several heavy bus lines would have to be re-routed from Kearny Street to Montgomery Street. Since no parking was already in effect, it appeared that the only feasible way to obtain the additional needed capacity was to remove the scramble signal control. There was a considerable outcry from newspapers and other groups against this project. While they were not opposed to the one way program, they felt that the removal of scramble would produce chaos and increase congestion tremendously on Montgomery Street in spite of the Traffic Engineer's studies. Since the need for one-way streets was evident, it was agreed, however, to institute the one-way streets and remove the scramble for a trial period of 90 days.

Field Studies

To determine whether the changes in traffic regulations were warranted and also to meet an expected barrage of criticism over elimination of scramble, an extensive group of "before and after" speed and delay and traffic volume studies were made. Traffic counting equipment was set up on Montgomery Street and throughout the downtown area and a "building-top" speed and delay study was made of traffic travelling on Montgomery Street. Both the "before and after" studies were taken in a period between 7:30 A.M. and 6:00 P.M. with 164 observations being taken during the "before" study and 251 observations during the "after" study.

Results of Study

Plates 2 and 3 show the results of the "Before and After" studies on Montgomery Street. Plate 2 shows the average traffic speeds and the "before and after" traffic volumes. They show that except for a half hour period between 5:00 and 5:30 P.M., that the average traffic speeds after removal of scramble were considerably higher than before removal despite a 33½% increase in traffic volume. This 33½% increase also included several bus lines

Montgomery and Bush Streets during the old days of "scramble."

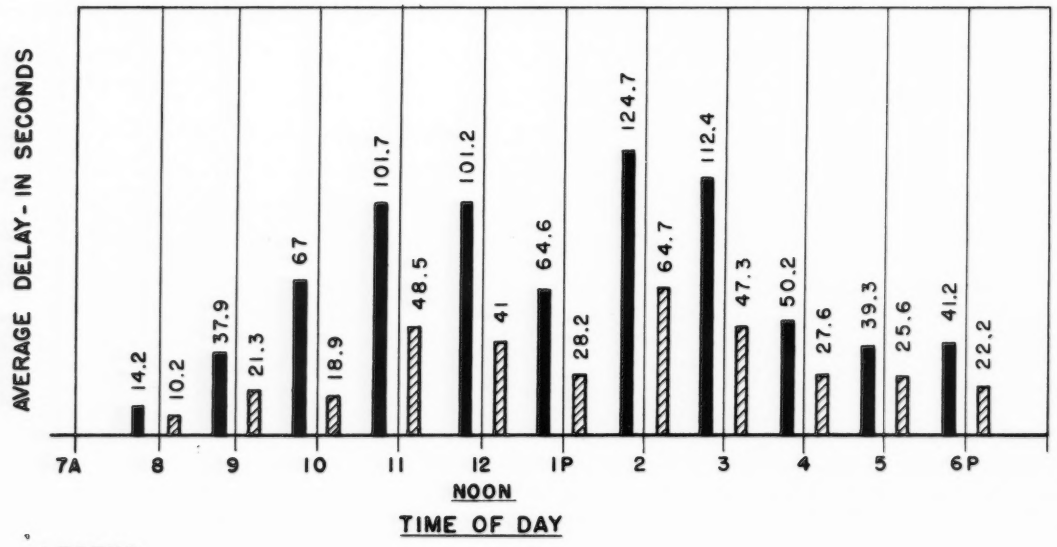
which, of necessity, had to stop to load and unload passengers on Montgomery Street. Taking the 12-hour period as a whole, the traffic speeds increased an average of 24% from 8.7 miles per hour to 10.8 miles per hour.

Plate 3 shows the average stopped delays per vehicle on Montgomery Street at various times of the day before and after scramble removal. It indicates that at all times the stopped delay per vehicle was considerably lower after removal of scramble. The weighted average of delays decreased from 67.3 seconds per vehicle for the overall period to 31.4 seconds per vehicle afterwards; a decrease of 35.9 seconds per vehicle or 53%.

Conclusions

The studies made confirmed our previous feeling that scramble, while very popular with the citizenry, was certainly not the most efficient method of

(Continued on page 35)



BEFORE & AFTER TRAFFIC DELAYS ON MONTGOMERY ST. BETWEEN SACRAMENTO & SUTTER STS.

PLATE 3

Traffic News

Yale Bureau Announces Traffic Engineering Fellowships and Scholarships

A number of fellowships and scholarships in Traffic Engineering at the Yale Bureau of Highway Traffic are available for the academic year starting in September, 1959. These awards are open to engineering graduates who wish to pursue professional careers in the field of street and highway planning, design, and operations.

FELLOWSHIPS

The Yale University Committee on Transportation awards fellowships on a competitive basis to applicants who are citizens of the United States. Each fellowship offers $2,200.00 which provides tuition and a living stipend of $175.00 each month during the academic year. The fellowships will be similar to those awarded last year as described below:

Automotive Safety Foundation Fellowships—Applicants should have had practical experience in city or state highway engineering, or in related fields. Preference will be given to those applicants who are now employed by public agencies in street and highway engineering and who secure a leave of absence in order to return to their present employer.

Esso Safety Foundation Fellowships—Candidates for these fellowships must be citizens of the following states: Maine, Vermont, Rhode Island, New Hampshire, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Tennessee, Arkansas, Louisiana, and the District of Columbia.

The James S. Kemper Foundation Fellowship—This fellowship is not restricted to any particular group or region but is available for professionally qualified men desiring to pursue the profession of traffic engineering.

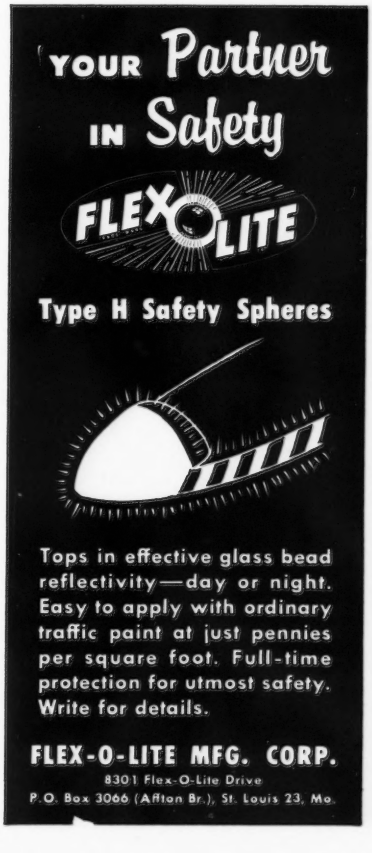
Liberty Mutual Fellowship — Applicants for this fellowship must show evidence of aptitude and interest in traffic engineering. They are not restricted to any particular group or region.

SCHOLARSHIPS AND OTHER AIDS

The Committee on Transportation also awards tuition scholarships to deserving students. These awards do not provide living stipends. Special consideration will be given qualified applicants who receive living stipends from their employers while in school. The course has been approved by agencies providing financial aid to veterans and foreign students.

INFORMATION AND APPLICATION FORMS

Applications for admission and special forms for fellowship application may be obtained by writing to the Director, Bureau of Highway Traffic, Yale University, Strathcona Hall, New Haven 11, Connecticut. The closing date for filing fellowship applications is MARCH 1, 1959.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Standards for Advertising Signs on Interstate System Announced

Standards for state guidance in regulation of outdoor advertising along the Interstate System, prepared in compliance with the 1958 Federal-Aid Highway Act, have been released in final form by the Secretary of Commerce. The standards are printed in the Federal Register of November 13, 1958.

The Secretary revealed that the standards would not be applicable to about 25 per cent of the 41,000-mile Interstate System. The standards have been liberalized in a number of instances from the proposed standards.

The 1958 Act declared it to be "in the public interest to encourage and assist the states to control" outdoor advertising signs, displays and devices in areas adjacent to the Interstate System where completely new right-of-way has been acquired after July 1, 1956. States agreeing to control advertising in accordance with Federal standards would be eligible for a bonus of one-half of one per cent of the cost of an Interstate System project. Segments of the system within incorporated municipalities or industrial or commercial areas could be excluded from control (upon application of the state and agreement by the Secretary), but would not be eligible for the bonus.

Signs Permitted in Protected Areas

The standards provide that the only signs permitted within "protected areas" (defined as all areas adjacent to and within 660 feet of the edge of the right-of-way of all controlled portions of the Interstate Stystem) are as follows:

Class 1—*Official signs:* Directional or other official signs or notices erected in accordance with state or Federal law.

Class 2—*On premise signs:* Signs advertising the sale or lease of, or activities conducted on, real property where the signs are located. Only one sign advertising the sale or lease of property is permitted under this class and only one sign advertising activities conducted thereon if the sign is located more than 50 feet from the advertised activity.

Class 3—*Signs within 12 miles of advertised activities:* Signs not prohibited by state law and advertising activities being conducted within 12 air miles of such signs.

Class 4—*Signs in the specific interest of the traveling public:* Only information about public places operated by Federal, state or local governments, natural phenomena, historic sites, areas of natural scenic beauty or outdoor recreation, camping, lodging, eating, and vehicle service and repair is deemed to be in the specific interest of the traveling public.

Class 2 or 3 signs, except Class 2 signs not more than 50 feet from the advertised activity, displaying any trade name referring to or identifying any service rendered or product sold more than 12 air miles from the signs, may not be permitted unless the name of the advertised activity which is within 12 air miles of such sign is displayed as conspicuously as such trade name. Such signs also qualifying as Class 4 signs may display trade names as defined in the following paragraph.

"A trade name is deemed to be information in the specific interest of the traveling public only if it identifies or characterizes a place or identifies vehicle service, equipment, parts, accessories, fuels, oils or lubricants being offered for sale at such a place. Signs displaying any other trade name may not be permitted under Class 4."

Informational Sites

Informational sites for the erection and maintenance of Class 3 and 4 advertising and informational signs may be established in accordance with the Regulations for the Administration of Federal-Aid for Highways. The location and frequency of such sites shall be determined by agreements between the Secretary of Commerce and the state highway departments.

Class 3 and 4 signs may be permitted within such sites in protected areas consistent with the following provisions: (1) all signs must be placed upon a panel, (2) panels shall not exceed 13 feet in height or 25 feet in length including border and trim but excluding supports, (3) individual signs shall not exceed 12 square feet in area and shall not be legible from the main-traveled way or a turning roadway, (4) only one sign concerning a single activity or place may be permitted within any one informational site, (5) Class 3 signs not qualifying as Class 4 signs may not be permitted in any informational site more than 12 air miles from the advertised activity, (6) signs may not move or have any animated or moving parts, (7) panels and signs may not be illuminated by other than white lights and no sign shall have any flashing, intermittent, or moving lights, (8) all lighting must be effectively shielded to prevent rays from being directed at the main-traveled way, or be of such low intensity so as not to impair the vision of a driver.

Class 3 and 4 Signs Outside Informational Sites

The following signs may be permitted within protected areas outside of informational sites: (1) Class 3 signs are permitted when the traffic is not served by an informational site within 12 air miles of the advertised activity, (2) Class 4 signs placed more than 12 miles from the nearest panel within an informational site, and (3) signs qualifying as both Class 3 and 4 signs are permitted under either of the above conditions.

Such signs placed in advance of an intersection of an Interstate highway and an exit roadway and visible to the traffic approaching such intersection may not exceed the following number:

Distance from intersection	*Number of signs*
0 - 2 mi.	0
2 - 5 mi.	6
more than 5 mi.	av. of 1 sign per mi.

Other conditions which must be met are: (1) only two signs are permitted within any mile distance measured from any point and no signs may be less than 1,000 feet apart, (2) no signs are permitted in protected areas where there is an entrance or exit roadway, (3) no signs are permitted in areas from where an entrance roadway enters the main-traveled way to 1,000 feet beyond, (4) no signs are permitted in scenic areas, and (5) not more than one sign advertising activities or giving information about a single place is permitted so as to be visible to traffic moving in any one direction on any one Interstate highway.

General Provisions

Class 3 or 4 signs erected outside of informational sites and Class 2 signs must meet the following conditions: (1) no sign is permitted which interferes with, imitates or resembles any official traffic sign, signal or device, (2) no sign may be permitted which obstructs a driver's view of official signs and approaching or merging traffic, (3) no sign may be illuminated by any flashing, intermittent or moving lights, (4) no lighting may be permitted unless the rays are effectively shielded from the main-traveled way or are of such low intensity so as not to cause glare or impair the vision of a driver, (5) no sign is permitted which moves or has any animated or moving parts, (6) no sign is permitted on trees, or painted or drawn upon rocks or other natural features, and (7) no sign may exceed 20 feet in length, width or height, or 150 square feet in area, including border but excluding supports except Class 2 signs not more than 50 feet from activities being advertised.

Exclusions

The standards shall not apply to markers, signs and plaques denoting sites of historical significance if their exclusion is provided for in the agreement. However, such agreements may expressly make all or any part of the standards applicable.

State Regulations

A state may elect to prohibit signs permissible under the standards without forfeiting rights to any benefits.

Traffic Engineering Seminar Set for March at N. U.

Technical training in traffic engineering will be conducted by the Traffic Institute of Northwestern University, Evanston, Ill., at an intensive three-week seminar March 2-20, 1959.

Held in cooperation with the Midwest Section, Institute of Traffic Engineers, the seminar will concentrate on methods of reducing urban-metropolitan area traffic problems through improved research, control, and planning.

Pointing out that there is an urgent need for more trained personnel to cope with rapidly expanding traffic volumes in many communities, George W. Barton, director of traffic engineering, the Traffic Institute, said the seminar has been planned to fill this need.

He added that the training will be especially valuable for city and county engineers with traffic responsibilities, junior traffic engineers in larger state and city departments, and those working on a professional level in related fields.

Barton emphasized that the seminar is designed for personnel with engineering training or experience.

During the three-week session, three main subject areas will be covered:

1. Methods of Research and Analysis: gathering accurate data on the

community's current street and highway traffic situation.

2. Techniques of Control and Regulation: making the best use of existing facilities by employing such procedures as one-way traffic systems, signals, channelization, vehicle loading facilities, and parking regulations.

3. Planning for Future Growth: elements of city planning, highway planning and design, planning for public transit, and design of parking facilities.

Seminar training will include lectures and demonstrations by staff of Northwestern University and the Traffic Institute as well as leading specialists in the traffic engineering field.

Tuition for the course is $195 plus $15 for a student study manual containing more than 300 pages. The reference manual has been specially prepared to illustrate many of the latest techniques in traffic engineering and supplements previously published texts.

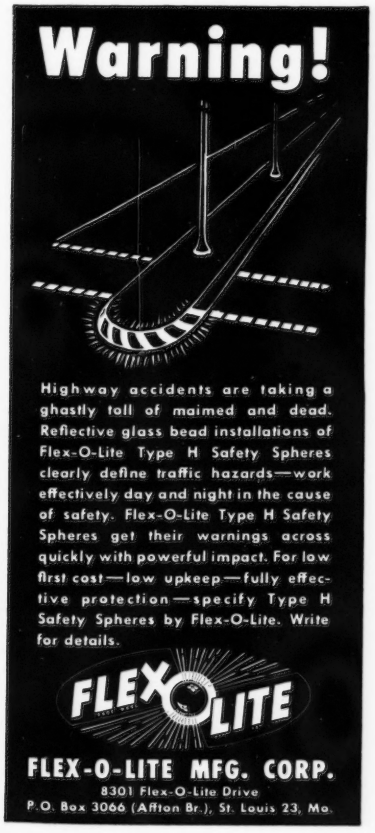
Applicants should meet one or more of the following registration requirements:

1. An engineering degree from a college or university or engineering experience on a professional level as an alternate for education.

2. Current employment on a professional level in a traffic engineering office or organization.

3. Employment on a professional level in a department of public works or as a city engineer with traffic engineering responsibilities.

Application should be made to the director of training, Traffic Institute of Northwestern University, 1804 Hinman Ave., Evanston, Ill.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Paul Gray Hoffman, first president and former chairman of the Automotive Safety Foundation, is shown (second from right) presenting his annual award for outstanding contributions in the safety field. James Stannard Baker, Director of Research, Traffic Institute, Northwestern University, was this year's recipient at the 46th National Safety Congress in Chicago. Ray Ashworth, Director of the Traffic Institute (far left) and Norman Damon, Vice President of the Automotive Safety Foundation, (far right) participated in the presentation.

Hoffman Award Presented to J. Stannard Baker

James Stannard Baker, director of research and development of the Northwestern University Traffic Institute, is the reciplent of the second annual Paul Gray Hoffman Award for outstanding professional service in highway safety. The presentation was made October 22 at the 46th National Safety Congress by Paul G. Hoffman, donor of the award.

The purpose of the Hoffman Award is to recognize and thus encourage the work of educators, engineers, enforcement officials, researchers, and others who, individually or as members of organized staffs, make their careers in traffic safety.

Mr. Hoffman was at one time chairman and president of the Automotive Safety Foundation, Washington, D. C., which serves as administrator of the award. Since then he has been, successively, head of the Economic Cooperation Administration (ECA), head of the Studebaker-Packard Corporation, and chairman of the Hoffman Specialties Manufacturing Company. He was a leading pioneer in the traffic safety movement.

In presenting the award, Hoffman took note of Baker's many distinguished contributions to the improvement of safety and efficiency in motor vehicle traffic.

Mr. Baker has occupied his present position at the Traffic Institute since 1946, where, in addition to his original work in research, he has given leadership in the development of training courses offered by the Institute, and has devoted a substantial part of his time to teaching. Prior to his appointment at the Institute, he had been director of safety in the Department of Street Railways of Detroit, and for eighteen years engaged in traffic engineering and driver licensing research and development in the National Safety Council. He is an electrical engineering graduate of the University of Wisconsin and an Associate Member of the Institute of Traffic Engineers.

Specific areas in which Baker has made significant contributions are:

... traffic engineering research in development of signs, signals, routing, and traffic procedures.

. . . studies of traffic law enforcement, including the first nationwide survey of traffic work of police departments.

. . . research in accident investigation and accident reconstruction.

. . . study of drivers, relating to vision, intoxication, fatigue, and relevant personality factors.

. . . establishment of principles relating to driver licensing, employed in development of driver tests, driver manuals, examiner manuals, training programs, license record systems, and used in most states today.

. . . pioneer work in the application of engineering techniques to motor vehicle fleet operations.

. . . research and publications in traffic safety education.

Ray Ashworth, Institute director, commenting on the award to Baker, said, "Throughout his career, Mr. Baker has been a vital force in the effort to make the nation's streets and highways a better, safer, more efficient part of our economy."

J. Roscoe Miller, president of Northwestern University, said, "His work at Northwestern University during the past 20 years as both an associate and staff member of the Traffic Institute has confirmed his reputation as one of the nation's outstanding traffic safety authorities."

Mr. Baker is now devoting his efforts to a major long-time research project looking into all relevant human factors in motor vehicle traffic accidents, in which he is directing the work of a large technical staff in the intensive investigation of selected actual accidents at the scene. The end purpose of this project is to produce procedural techniques adequate for determining the most critical aspects of the "human causes" of traffic accidents. It is anticipated that this project will constitute one of the longest steps ever taken toward understanding real, basic accident causes.

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James E. Loughran

James E. Loughran (Associate Member, ITE) died Monday, November 3, 1958, in Battle Creek, Michigan.

At the time of his death, Loughran was Chief, Movement Section, Emergency Community Services, Plans and Operations, Office of Civil and Defense Mobilization, a position he had held since November 1955.

Earlier he had worked for the Bureau of Public Roads, the Interstate Commerce Commission, the Pennsylvania Department of Highways and Allegheny County. From 1942 to 1948 he served in the Transportation Corps of the Army, holding the rank of Major. At the time of death he held the rank of Lieutenant Colonel in the Army Reserve.

An engineering graduate of the University of Maryland, Loughran held a Master's degree from the University of Pittsburgh, and was at work on a Ph.D. from American University in the field of transportation and public administration.

In addition to his membership in the Institute of Traffic Engineers, he was a member of the National Defense Transportation Association, the Battle Creek Engineers Club and the American Society for Public Administration.

Survivors include two sisters and a brother, all residing in Pennsylvania.

Engineering Shortage Claims Decried by NSPE

Dire predictions and rumors concerning the so-called engineering shortage are a disservice to the nation and the engineering profession because they are not based on sound analysis.

Misguided neutrality on the part of industrial management regarding the unionization of engineers could result in a complete breakdown of the concept of professionalism in industry.

These positions and others taken by the NSPE Board of Directors at the fall meeting in San Francisco, October 23-25, represent actions by the group on a broad front.

The Board issued a plea to the nation to stop "adding fuel to the shortage fire." The officials called upon all communications media to "weigh carefully the facts, and soberly analyze those facts, before starting a new wave of publicity to the effect that the nation faces a severe engineering manpower shortage."

The National Society directors urged that all those who intend to speak or publish articles on the subject of engineering manpower first consider the following four points:

1. Engineering school enrollments are at an all-time high and are continuing to increase without artificial stimulation.

2. Action which may force-feed students into engineering curricula without adequate assistance to the overburdened engineering schools can only harm the cause of engineering education.

3. The current engineering need in industry and advanced technology is one based on qualitative, rather than quantitative factors. The serious technological problems facing the nation cannot be resolved by merely adding to the number of engineers.

4. Greater utilization of existing engineering manpower is recognized by all serious students of our manpower problems as a first priority item.

After Board action on a unionization report, Dr. Clark A. Dunn, Society president, Stillwater, Oklahoma, said in an interview that the "neutral attitude taken by management in some firms when faced with an election among engineering employees on the question of union representation is actually an abdication of management's responsibility in preserving the distinc-

tion between professional and nonprofessional services."

Dr. Dunn pointed out that "such an abdication of management responsibility has led to a situation in the aircraft and other industries here on the West Coast in which many young engineers have never heard an expression of support concerning professionalism from their employers."

In other significant developments, James N. Landis, president of the American Society of Mechanical Engineers, told the Board at a luncheon meeting that the AIEE functional plan for unity was not acceptable to the majority of the presidents of the founder societies. Tracing the history of the proposal which would assign technical responsibilities to the Engineers' Joint Council, educational subjects to the Engineers Council for Professional Development, and professional duties to the NSPE, Mr. Landis closed his presentation by reading a recent action by the American Society of Civil Engineers which urged NSPE to join the EJC.

Later NSPE Past President Garvin H. Dyer, chairman of the Society's Intersociety Relations Committee, asked the Board to approve the following recommendations of his group:

1. That the NSPE president be authorized to formally invite each of the five founder societies (through the president of each) to name a member of its board or executive committee as a continuing observer to attend each NSPE Board meeting, at which such observer will have the privilege of the floor. In order to most effectively establish the necessary communication and liaison, such observer shall make a comprehensive report back to his board and members of his own society and shall be delegated to attend, if at all possible, all of the NSPE Board meetings during the term of his tenure, which shall be for a period of at least one year. The expenses of such an observer so named and acting in attending NSPE Board meetings shall be paid by NSPE on the same basis as the expenses of national directors.

2. That the president be authorized to invite the presidents of each of the founder societies to designate an individual or individuals to establish liaison with those committees of NSPE in which each such society has an interest.

3. That there be a mutual exchange of helpful services extended to the re-

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Typical Pennsylvania installation at the Upper Marion High School, Montgomery County, Pennsylvania. (Sale made by the W. F. Keegan Company) Standard Model BR-25-ATN with standard Pennsylvania Highway SCHOOL SPEED LIMIT Sign measuring 30" x 54", black letters on white background.

Time clock providing three on and three off positions per day, eliminating operation Saturday and Sunday.

Alternate flashing amber lens to provide target value to the speed limit and attract drivers' eye to the sign.

Blank out type speed limit indication in portland orange color. Speed limit is legible only during the ON position. At all other times the speed limit (15 in this case) is illegible and the original or regular speed limit is in effect. Flashers and speed limit indication work together, with amber lens alternately flashing and the illuminated portland orange speed limit indication continuously illuminated.

Model BR-25-ATN is complete with 1½" hubs (Part P-15) mounted top and bottom. Signs such as above or your state standard can be furnished. Brackets for any size post or pole can be furnished. (Cat. No. M-10)

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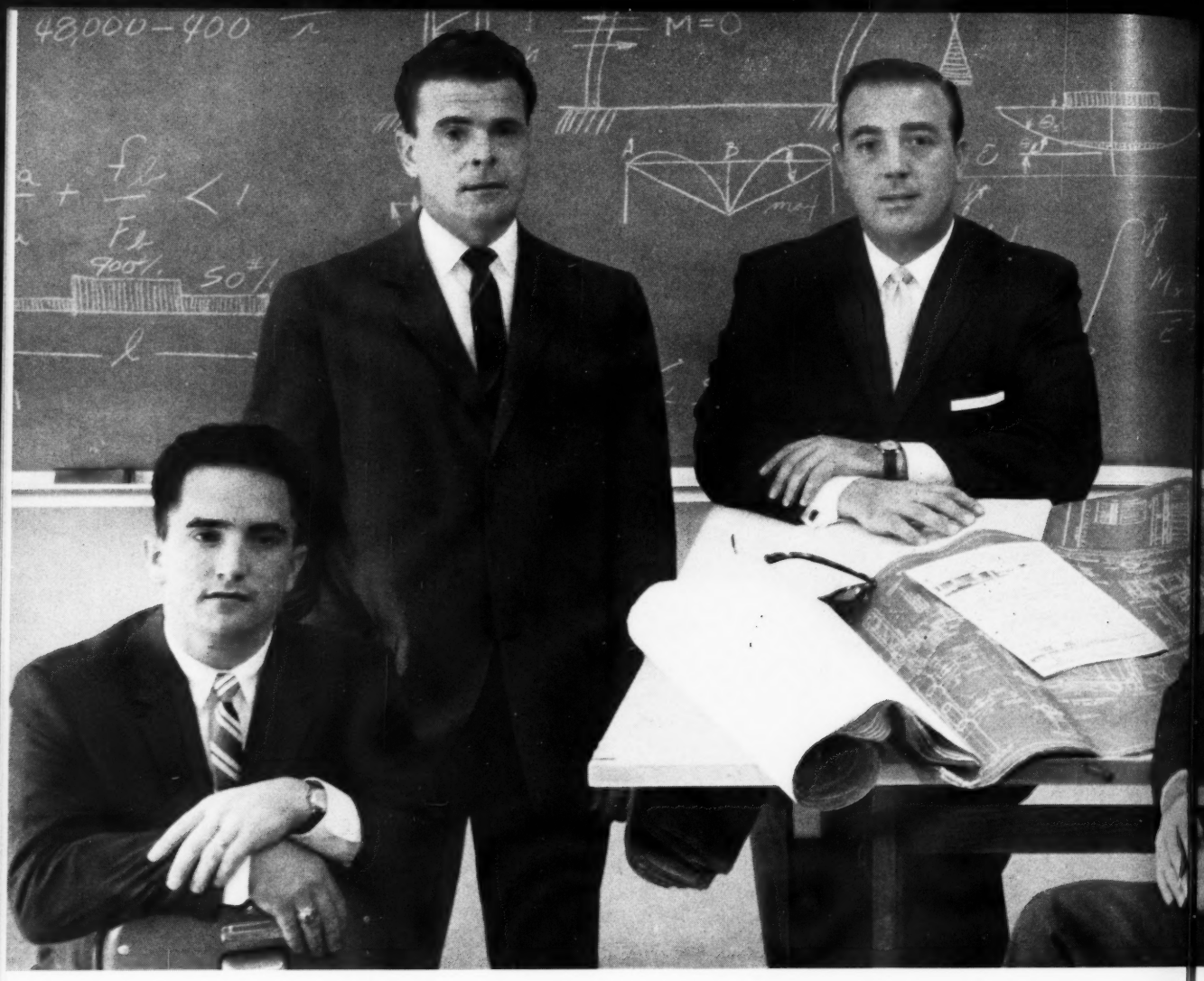

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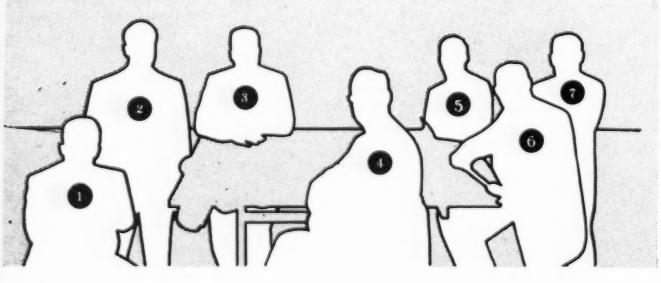

For state highway departments and their consulting engineers

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Divisional Sales Manager of Pfaff & Kendall, specializing in sign spans, signal spans and traffic signal standards.

2 WALT SCHOENFELDT
General Manager of Traffic & Street Sign Company, offers expert knowledge of every phase of sign operation.

3 GEORGE MASEFIELD
Committee Coordinator known over the country, available for consultation at any time.

4 DICK SIVER
Professional neer wit
perience in ic plan
operations.

More

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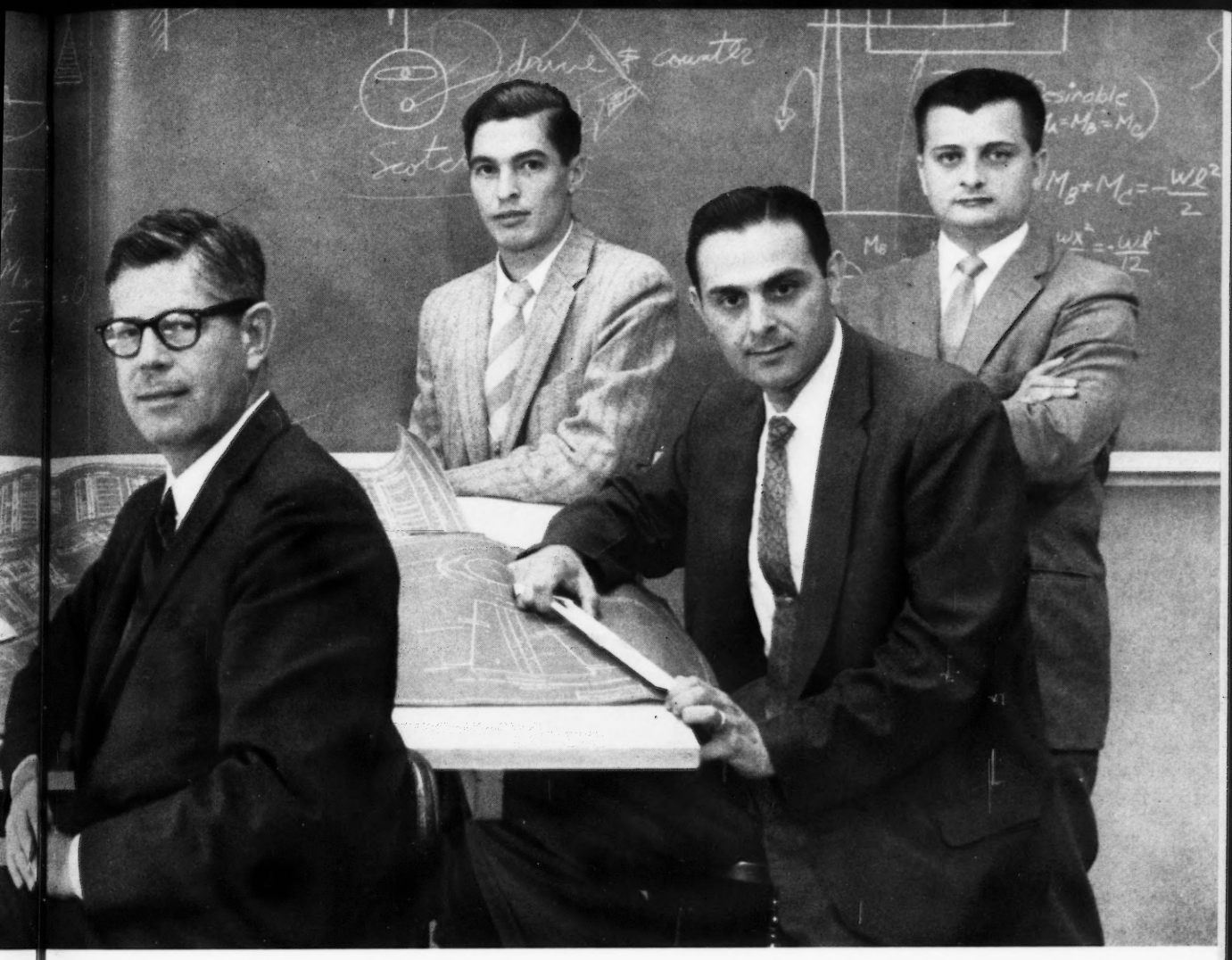

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spective membership of the NSPE and the five founder societies on a basis of mutual agreement between any society and NSPE.

4. The immediate offering of NSPE services and publications as outlined herein to each of the founder societies who approve the Functional Plan, the financing of which is to be on an equitable basis agreeable to both parties.

5. The publication and distribution of a comprehensive, but condensed, brochure on "Unity and the Organization of the Engineering Profession," this brochure to contain the history, objectives and results of previous efforts toward effecting a full coordination within the profession, setting forth the philosophies of the several efforts and the advisability of effective coordination within the profession, to provide background and information as a basis for discussions of the proposed Functional Plan.

6. The preparation and distribution of a kit of information to state societies and local chapters as to how they can cooperate in the implementation of the Functional Plan.

7. That liaison between NSPE and EJC and ECPD shall be coordinated at the organizational level rather than at the activity level.

Coming Events

1959

January 5-9—HIGHWAY RESEARCH BOARD — Sheraton Park Hotel, Washington, D. C. Contact: HRB, 2101 Constitution Ave., Washington 25, D. C.

January 29-31 — CALIFORNIA STREET AND HIGHWAY CONFERENCE — 11th Annual Conference, Berkeley. Contact: Institute of Transportation and Traffic Engineering, University of California, Berkeley, California.

February 26-27—ILLINOIS TRAFFIC ENGINEERING CONFERENCE— University of Illinois, Urbana, Ill. Contact: John E. Baerwald, 401 Civil Engineering Hall, Urbana, Illinois.

March 1-3—SOUTHERN SAFETY CONFERENCE Battery Park & George Vanderbilt Hotels, Asheville, N. C. Contact: W. L. Groth, Exec. Dir., P.O. Box 8927, Richmond 25, Va.

March 23-25 — WESTERN SAFETY CONGRESS — Ambassador Hotel, Los Angeles, California. Contact: Joseph M. Kaplan, Greater LA Safety Council, 3388 W. 8th St., LA 5, Calif.

April 14-16—MICHIGAN SAFETY CONFERENCE Civic Center, Lansing, Michigan. Contact: Gordon H. Sheehe, Highway Traffic Safety Center, M.S.U., East Lansing, Mich.

May 10-14—AMERICAN SOCIETY OF PLANNING OFFICIALS— Annual Conference, Hotel Leamington, Minneapolis, Minn. Contact: ASPO, 1313 East 60th Street, Chicago 37, Ill.

Philadelphia Initiates Unique Plan to Encourage Mass Transit

Philadelphia's "Operation Northwest," launched the end of October after months of planning and preparation, is being closely watched by local government and transportation officials of other large cities as the nation's first municipally sponsored experiment in low-cost combination bus-rail mass transportation.

Involved in the six-month experiment are the Chestnut Hill lines of the Pennsylvania Railroad and the Reading Railroad and several connecting bus routes of the Philadelphia Transportation Company. These lines all serve the northwestern part of Philadelphia, which while within the city limits, is, over most of its area, a typically suburban community.

The railroads have substantially increased their train schedules and accepted a flat one way fare of 30 cents between their Chestnut Hill and intermediate stations and their downtown terminals, where fares formerly ranged from 33 to 53 cents. But schedules have been rearranged for convenient train connections, and a bus-rail transfer ride is sold for 40 cents, of which the transit company receives 11 cents (instead of the usual bus fare of 20 cents) and the railroad receives 29 cents.

No subsidy in the usual sense is involved. Instead, City Council has appropriated $160,000 from which to reimburse the railroads for the net cost of their additional services, after deduction of any increase in revenues they may receive. Thus, the City, acting as agent for the commuters and other citizens using the service, is doing essentially what is required of any group or organization wanting a special train. Such groups are traditionally required to guarantee a minimum number of fares. A difference is that the minimum guarantee required of a special train group would be calculated to allow a profit on the operation, while "Operation Northwest" assures neither a profit on the increased service nor any reduction of existing losses.

City Solicitor David Berger has stated that the City's financial commitment does not represent a subsidy to the railroads, but is rather a subsidy to the riders. The City's objective, of course, is to determine whether increased service, reduced fares, and the convenience of bus-rail transfers will induce a substantial number of citizens to leave their cars at home and use public transportation facilities, thus relieving serious and costly center-city traffic congestion and ever-increasing access highway and parking requirements.

Smiling Richardson Dilworth, Mayor of the City of Philadelphia, mounts a marker flag for the "Northwest Express" of the Reading Railroad—one of the initial trains to run in a new lower fare, extra service rail-bus "experiment" sponsored by the City in cooperation with the Pennsylvania and Reading railroads, and the Philadelphia Transportation Co.

Revised Signal Head and Controller Standards Approved by ASA

Revised standards for traffic signal heads and controllers developed by Technical Committee 7-A of the Institute of Traffic Engineers have been approved by the American Standards Association. Formal approval was granted on October 16, 1958, according to word from ASA.

The three standards are officially designated as follows:

American Standard Adjustable Face Traffic Control Signal Head Standards, D10.1-1958

American Standard Pre-Timed Fixed Cycle Traffic Signal Controllers, D11.1-1958

American Standard Specifications for Traffic-Actuated Traffic Signal Controllers and Detectors, D13.1-1958

The three new standards replace older standards of the Institute, also approved as ASA standards. The earlier standards were adopted as far back as fifteen years ago, and have become widely recognized in the traffic engineering field. It is anticipated that the new standards will be equally valuable.

Numerous minor changes have been published by the Institute, identified as Technical Bulletins 1, 2 and 3. Single copies will be sent to every Institute member without charge, and will be available to others at 50 cents per copy.

Training Opportunities

1959

January 28-30—FREEWAY OPERATIONS SEMINAR—

The fifth in the current series of Freeway Operations Seminars will be held at the Bon Air Hotel, Augusta, Georgia under the sponsorship of the Southern Section of the Institute of Traffic Engineers. Traffic engineers, planners, design engineers, traffic police supervisors and others with responsibility now or in the future for the planning, design or operation of controlled access facilities are invited. For reservation forms and additional information, contact W. S. Derrick, c/o Georgia State Highway Dept., Atlanta, Ga.

February 2 - 4—FREEWAY OPERATIONS SEMINAR—

The sixth in the current series of Freeway Operations Seminars will be held at the Western Hills Inn, Euless, Texas (halfway between Dallas and Fort Worth) under the sponsorship of the Texas Section, ITE. Planners, engineers, and enforcement supervisors who will have responsibility for planning, designing or operating controlled access roadways are invited. For reservation forms and further information, contact T. Robert Buckman, 950 Jennings Street, Fort Worth, Texas.

March 2-20—TRAFFIC ENGINEERING SEMINAR

Sponsored by Northwestern University Traffic Institute and the Midwest Section, ITE. For traffic engineers and others with engineering backgrounds. Tuition $195. For information, address: Northwestern University Traffic Institute, 1704 Judson Ave., Evanston, Ill.

April 15-17—FREEWAY OPERATIONS SEMINAR

A seminar will be held at the Moraine Hotel, Highland Park, Illinois, under the sponsorship of the Midwest Section. Planners, engineers and enforcement officials who are or will be responsible for the planning, design or operation of controlled access facilities are invited. For reservation forms and further information, contact George Hagenauer, Illinois Division of Highways, 160 N. LaSalle Street, Chicago 1, Illinois.

April 20-22—FREEWAY OPERATIONS SEMINAR

A seminar will be held at the Town House, near Omaha, Nebraska, under the sponsorship of the Missouri Valley Section. Planners, engineers, and enforcement officials who are or will be responsible for the planning, design or operation of controlled access facilities are invited. For reservation forms and further information, contact Robert L. Meyer, Department of Roads, State Capitol, Lincoln, Nebraska.

N. J. Turnpike Reports Success in Meeting Emergencies

The New Jersey Turnpike Authority has developed a "unique standby" system for providing emergency equipment for accidents. It has been termed as one of, if not the, most practical and effective systems on the nation's highways.

Authority Chairman Joseph Morecraft, Jr., credited the system as a basic factor in keeping the Turnpike's fatality rate among the lowest in the nation. He said that the records disclose no instances where lives could have been saved by speedier emergency service.

"Currently, 36 first aid squads and 22 fire departments are included in the Authority's 'standby system'" said Chairman Morecraft. "These units divide the 131 mile superhighway into 'overlapping areas of responsibility' of about eight miles each."

For this service, the Authority makes a substantial contribution every six months to each participating unit. In addition, each first aid squad receives $25.00 for each call and the fire departments $50.00 for each piece of apparatus.

Records of State Police assigned to the Turnpike, who are also contributing to the remarkable safety record, indicate that an ambulance arrives on the scene of an accident at any location generally at not more than 15 minutes from the "call time."

There is a standby first aid squad within three minutes from all points of entry to the Turnpike. Where interchanges are far apart, the Authority has provided emergency entrance gates connecting with local roads.

The first aid squads on the Turnpike have an average membership of 24 men with some exceeding 50 members. Within minutes these squads can have two ambulances on the road and specially equipped crash trucks with portable generators and lights. Several squads have attending physicians supplementing highly trained personnel.

In addition to the 36 standby squads, the Authority has engaged an equivalent nucleus of units auxiliary to the standby squads. These auxiliary units serve in the event the regular units are on another call, or when additional units are required.

Washington Parking Operator to Ease the Big Squeeze

A Washington parking operator has announced that he will park a "small" car for one-third less than it costs your big car neighbor.

L. B. Doggett, Jr., is the first commercial parking operator in the nation to announce the conversion of one of his lots into a facility exclusively for small cars, allowing the drivers of such autos a one-third discount on monthly parking rates.

The announcement comes close on the heels of a decision by New York City parking operators to raise rates from 15 to 30 per cent on most of the longer, lower, wider 1959 cars. A St. Louis lot went so far as to bar completely some longer, high-priced autos.

"While I am well aware of what these operators are up against," said Mr. Doggett, "we have no plans at the present time to increase rates on larger cars. What we are doing is rewarding the small car owners with a discount to which they are justly entitled.

"It's just pure economics," he continued. "A housewife wouldn't be expected to buy a whole extra yard of material she'll never use for making a dress. Why should anyone be expected to pay for an extra yard of valuable downtown real estate they never need for parking their automobile?"

Mr. Doggett, a past president of the National Parking Association and current president of the Washington Parking Association, said that his new rates will enable small car drivers to park for $15 per month in comparison with his current rate of $22.50.

Any vehicle measuring 6½ by 14 feet or less will be classified as a "small car," he explained. A total of 42 such vehicles can be accommodated on space normally required for parking only 20 of the newer American models.

While current plans call for the conversion of only one of Mr. Doggett's 17 lots and garages into small car facilities, he said that others would undoubtedly be switched over to such operations "depending on the demand."

PLANET OVERHEAD SIGN STRUCTURES

erected with minimum traffic interference

There's no need to close lanes or reroute traffic when a Planet overhead sign is erected. When erection crews put the light-weight, all-aluminum overhead structure in place there is a minimum of traffic interference. Note that cross-member design permits several inches of tolerance if footings are not exactly aligned. These fast erection features substantially lower erection costs.

All-aluminum sign structures engineered by Planet are rugged. They offer maintenance-free support for large overhead signs and lights that will withstand hurricane force winds. No painting is ever required and there are no rust problems.

In accordance with your specifications, Planet will build and erect, or build only, overhead sign structures in any size or quantity. Write or phone today.

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- Traffic & Safety Equipment
- Engineered Handling Systems
- Automation Equipment

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Bartelsmeyer Elected AASHO President for 1959; Will Meet in Boston

Ralph R. Bartelsmeyer, Chief Highway Engineer of Illinois, was named president of the American Association of State Highway Officials for 1959 at their recent meeting in San Francisco. He succeeds Claude R. MacMillan of South Carolina as head of the organization. The Association voted to hold its 1959 meeting in Boston.

Other officers named for the ensuing year are:

First vice president, David H. Stevens, Chairman of the State Highway Commission of Maine.

Regional vice presidents: Region I, J. N. Robertson, Director of Highways of the District of Columbia; Region II, R. B. Richardson, Director of the Department of Highways of Louisiana; Region III, John C. Mackie, Commissioner of the State Highway Department of Michigan; Region IV, William E. Willey, State Highway Engineer of Arizona.

Named to new terms on the Executive Committee were: F. A. Davis, Chief Engineer of the Department of Highways of Virginia; John O. Morton, Commissioner of the Department of Public Works and Highways of New Hampshire; and William A. Bugge, Director of Highways of the State of Washington.

E. L. Roettiger, State Highway Engineer of Wisconsin was renamed treasurer.

City Planning Fellowships Offered At Carolina

Applications for graduate fellowships and assistantships for 1959-60 in city planning and related fields at the University of North Carolina are being accepted through February 15.

The J. C. Nichols Foundation of the Urban Land Institute offers a grant-in-aid of $2,400 to a student eligible for admission to the Graduate School of the University of North Carolina who wishes to work toward an advanced degree. The recipient of the award will be expected to carry on a program of research within one of the following areas of study: (1) the long run implications for urban development in the location and expansion of regional shopping centers; or (2) cost-revenue analysis of governmental services in the central business district.

Research and graduate assistantships are available through the Urban Studies Program of the Institute for Research in Social Science and the Department of City and Regional Planning. These carry stipends ranging from $750 to $1,800 a year. Recipients are permitted to pay tuition at the in-state rate of $150 a year.

For information regarding the J. C. Nichols Foundation Award and other grants available through the University of North Carolina write to John A. Parker, Chairman, Department of City and Regional Planning, University of North Carolina, Chapel Hill, N. C.

TOMORROW'S TRANSPORTATION

(Continued from page 13)

improve highway design and planning, (2) increase traffic efficiency and safety, (3) integration of transportation planning and urban development, and (4) in the correlation of street transportation, public transit and parking. We can also make a great contribution in the broad field of research.

To meet these responsibilities and take full advantage of the opportunities we must broaden the training of both highway and traffic engineers. More engineering colleges will have to add traffic engineering courses to their highway engineering curriculums if the growing demand for fully-trained highway transportation specialists is to be met. Fortunately, this educational need is being increasingly recognized by colleges and universities.

Certainly the years ahead will be exciting. In addition to the romance and stimulation provided by the bold new highway development program, in which the traffic engineer will play an important role, there is the equally exciting task of devising still more effective measures for the vast existing street and highway systems. In this area alone there remains a terrific challenge. With little chance to expand the surface street system, particularly in urban areas, the traffic engineer will be increasingly called upon to stretch to the maximum the capacity of these fixed facilities. New system concepts, new control devices, new methods, new tools of all kinds will be needed.

Working as an integral part of the transportation team, the traffic engineer will continue to make a unique, vital and growing contribution.

New Publications

Pavement Slipperiness Factors and Their Measurement

Bulletin 186, Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C. September 1958. 81 pp. $1.60

This bulletin presents information on some promising new methods for measuring the resistance to slipping of rubber tires on pavement surfacing materials. The results of both field and laboratory tests are reported.

Six of the reports describe how and to what extent the skidding of locked wheels was influenced by different compositions and conditions (wet and dry) of the pavements.

Another paper describes the development of equipment and a method for determining, by means of pretesting, the potential slipperiness of various road surfaces. Still another paper gives results of the tests made to show the polishing characteristics of certain kinds of aggregates commonly used in pavements.

During the time these studies and developments were in progress in the United States much research on this problem of skidding was being done in Great Britain and some other European countries. A knowledge of this situation brought about the planning of the First International Skid-Prevention Conference for the second week in September 1958, at the University of Virginia.

Applications of Skid-Resistant Surfaces to Highways

Bulletin 188, Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C. September 1958. 18pp. $0.50.

This bulletin contains two papers presented at the 37th Annual Meeting of the Highway Research Board.

The paper "Test Installations of Thin Silica Sand Asphalt Resurfacing," by Alvin L. Reufer, discusses the method used by The Port of New York Authority to determine when a pavement should be resurfaced, and some of the special problems and materials involved. Problems of headroom and drainage in tunnels and of additional weight and expansion joints on bridges require thin resurfacing. This type of construction introduces additional problems. The new materials used, the costs, the anticipated life, and the advantages and disadvantages of each are described.

The paper "Development of Techniques for Applying Resinous Skid-Resistant Surfaces to Highways," by H. S. Nagin, D. S. Herr, T. G. Nock, and J. L. Keenan, describes a procedure for applying a liquid modified epon resin binder and a grit cover to a prepared roadway surface.

Automobile Facts and Figures

1958 Edition. Automobile Manufacturers Association, New Center Building, Detroit 2, Michigan. 72 pp.

This is the 1958 edition of a volume produced annually by AMA. It contains much statistical information on automobile production and use, together with driver, highway and traffic information which is valuable to anyone working in this field.

Highway Safety and Traffic Control

The Annals of the American Academy of Political and Social Science, 3937 Chestnut Street, Philadelphia 4, Pa. November, 1958. 209 pp. $2.00 ($1.50 to members).

This volume of *The Annals*, edited by John W. Gibbons of the Automotive Safety Foundation, is devoted in its entirety to the subject of highway safety and traffic control. It contains fifteen articles on the subject, and is by far the most comprehensive symposium on the subject available anywhere.

Of special interest to traffic engineers will be articles by Wilfred Owen on automotive transportation in the U.S., by Charles A. Chayne on automotive design, by E. H. Holmes on highway design, on research by James A. Malfetti, and urban planning problems by Sergei N. Grimm.

New Appointments

Colby Enters Consulting Firm in Boston

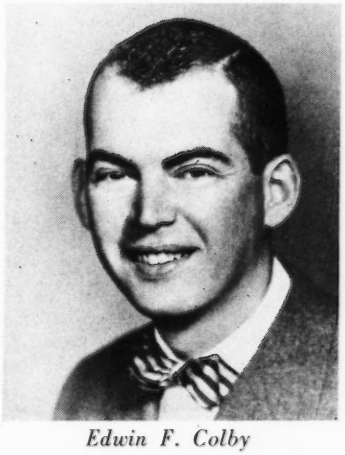
Edwin F. Colby (Mem. ITE), has joined the staff of Bruce Campbell & Associates in Boston, Massachusetts.

Since 1952 Colby had been a Planning and Design Engineer with the Traffic Engineering Department of Providence, Rhode Island. In 1954 he was appointed Assistant Traffic Engineer.

Prior to this Colby held a position in the Urban Section of the Traffic Engineering Department of the State of Washington.

During World War II he served three years with the U. S. Navy and presently holds the rank of Lieutenant.

In 1953 Colby was awarded first prize in the General Motors National Highway Contest for the State of Rhode Island.



Edwin F. Colby

A civil engineering graduate of Yale University, Colby received a certificate from the Yale Bureau of Highway Traffic in June 1950. He is a registered professional engineer.

He will be assigned to projects in the traffic engineering and planning fields, in which the firm specializes.

Barnett Moves to Sioux City; Leaves Consulting Field

Norman C. Barnett (Assoc. Mem., ITE) has moved to Sioux City, Iowa, to become that city's first Traffic Engineer.

For the past two years, Barnett was in New Orleans with Palmer and Baker, consulting engineers. While there, he conducted a comprehensive survey of Jefferson Parish, Louisiana (a county in the New Orleans metropolitan area) and developed a major street and expressway plan for the Parish.

Following his graduation from the University of New Mexico in 1951, he served as Assistant Traffic Engineer of Albuquerque for one year before attending the Yale Bureau. After receiving his certificate, he became Traffic Engineer of Tulsa, where he served three and a half years before entering the consulting field.

Barnett has been active on several ITE committees, and has served as Associate Editor for TRAFFIC ENGINEERING. He is the author of several articles.

Villegas Joins Staff of Auto Club of Southern California

George C. Villegas (Assoc. Mem., ITE) has joined the staff of the Automobile Club of Southern California as Traffic Engineer.

For the past two and a half years, Villegas has been with DeLeuw, Cather and Company, working in both Northern and Southern California. Earlier he served with the California Division of Highways, spending six and a half years in the District around Los Angeles.

A civil engineering graduate of the University of Southern California, Villegas will be working in the Engineering Department of the Auto Club, of which John McDonald is manager.

Hope Elected ASF Board Chairman

Stanley C. Hope, former President of Esso Standard Oil Company, was elected chairman of the Board of Trustees of the Automotive Safety Foundation at the annual meeting of the Trustees in Chicago on October 30.

He succeeds Lieut. General Levin H. Campbell, Jr., who retired after serving six years as chairman.

Mr. Hope retired from the presidency of Esso last August 1. He had served since 1949 in that post, following a year as executive vice president of the company. Previously he had been president of the Gilbert & Barker Manufacturing Company.

A member of the Foundation's board since 1954, Mr. Hope also has been vice chairman, representing the petroleum industry, and a member of the ASF Operating Committee.

General Campbell was formerly executive vice president of International Harvester Company, and during World War II was U. S. Army Chief of Ordnance.

John F. Gordon, recently named president of General Motors Corporation, was chosen as a member of the Operating Committee in today's election, succeeding Harlow H. Curtice, former GM president.

Mr. Curtice and four other retired board members who have been active in leadership of the Foundation since its establishment in 1937 were named honorary trustees. The others include Alfred P. Sloan, Jr., honorary board chairman of GM; Alexander Fraser, former president of Shell Oil Company; B. E. Hutchinson, former Chairman, Finance Committee, Chrysler Corporation, and Paul G. Hoffman, former president of the Studebaker Corporation, who served 12 years as the Foundation's first president and chairman.

Mr. Gordon also was named to the Board of Trustees. Other representatives of the automobile industry added to the board include H. E. Churchill, president, Studebaker-Packard Corporation; J. J. Timpy, vice president, American Motors Corporation; and Harry A. Williams, managing director, Automobile Manufacturers Association.

New trustees from the automotive parts and accessory industry include James P. Falvey, president, Electric Auto-Lite Company; R. A. Stranahan, Jr., president, Champion Spark Plug Co., and John D. Wright, president, Thompson Products Co.

James F. Oates, Jr., president, Equitable Life Assurance Society, was named to the board representing life insurance companies.

The Foundation, a non-profit organization which provides grants of funds and technical staff services in behalf of safe and efficient highway transportation, is supported by more than 600 companies and associations. At the meeting leading executives attended from the automotive, petroleum, steel, tire, cement, parts and accessory, asphalt, auto finance, banking, advertising media and insurance fields.

Havenner Retires from Los Angeles County Road Department

Vernon Havenner (Assoc. Mem., ITE) retired on October 3rd after 27½ years with the Los Angeles County Road Department.

Havenner's career in traffic engineering began in July 1928 when he went to work for R. T. Dorsey, Traffic Engineer for the City of Los Angeles. He remained with the City until January 5, 1931.

On this same date, the County of Los Angeles appointed him engineer in charge of maintaining its traffic control devices, which consisted, for the most part, of 19 "Waterhouse Disc Type" signals.

His most recent duties consisted of the administration and supervision of installation and maintenance of traffic signals, street lighting, parking meters and other traffic control devices.

Havenner's retirement was a result of "doctor's orders" issued after the latest spell of coronary heart disease. He is a Registered Electrical Engineer in addition to being an Associate Member of the Institute of Traffic Engineers.

Esso Scholarships to Kaiser and Bonelli for Yale Study

John M. Kaiser and Edward Bonelli, Assistant Civil Engineers in the New York City Department of Traffic, were awarded the annual Esso Foundation Scholarships to the Yale Bureau of Highway Traffic.

The two fellowships were awarded on the basis of scholastic achievement and dedication to the profession of traffic engineering. Mr. Kaiser, who directs the Intersection Control Survey Section, is a graduate of the City College of New York and has been a member of the Traffic Department since his discharge from the armed forces in 1956. He is a Junior Member of the Institute of Traffic Engineers.

Mr. Bonelli, who heads the Traffic Services Survey Section, is a graduate of New York University and has been attending the Brooklyn Polytechnic Institute. He joined the Department in 1953.

Upon completion of their studies, Messrs. Bonelli and Kaiser will resume their posts in the Traffic Department.

JOB CHANGES

Edwin L. Beck—from Palmer & Baker, Inc., New Orleans, to Albuquerque, New Mexico, as Traffic Designer.

H. M. Cavanaugh — from the presidency of Wood Electrical Construction Company, Chicago, to the position of Executive Vice President of the Hyre Electric Company, Chicago.

W. E. Ewens — from the consulting field to the position of director of the Department of Traffic in Hamilton, Ontario, Canada.

Forest H. Green—formerly Associate Professor of Highway Engineering, Purdue University, West Lafayette, Indiana; now a Design Engineer with the U. S. Bureau of Public Roads in Washington, D. C.

Paul I. Wagner — formerly the District Traffic Engineer at San Luis Obispo, California; now Assistant State Construction Engineer with the California Division of Highways at Sacramento.

Thomas Walbert—formerly an Associate Traffic Engineer, Wilbur Smith & Associates, New Haven, Connecticut; now a consultant in New York City operating as Thomas Walbert & Associates.

TITLE CHANGES

David S. Johnson, Jr.—from Planning Engineer with the Connecticut Highway Department to Assistant Chief of Planning.

Arthur H. Lomax — formerly Traffic Coordinator for the Department of Traffic, Hamilton, Ontario, Canada; now Deputy Director of the Department.

Sam Osofsky—from the position of Supervising Highway Statistician, California Division of Highways, Sacramento, to Highway Economist.

Joseph L. Thornton — from District State Aid Engineer, Washington Department of Highways, Seattle, to Assistant State Aid Engineer in Olympia.

Melbourne H. West—from Supervising Highway Engineer of Highway Planning Survey, California Division of Highways, Sacramento, to Engineer of City and Cooperative Projects.

Robert E. Williford—from Traffic Engineer, Port of New York Authority, in New York City, to Assistant Manager of the George Washington Bridge at Fort Lee, New Jersey, for the Port of New York Authority.

"SCRAMBLE"

(Continued from page 22)

moving traffic in downtown San Francisco. Previous studies indicated that traffic moving through the system was delayed an increased 48.2% by the institution of scramble. We were very gratified to find that despite the very great increase in traffic volumes and the introduction of bus traffic on Montgomery Street, we still came out with a net gain of 24% in traffic speeds through the removal of the scramble system.

While the results we have found may not be applicable universally, they do provide a factual and quantitative study in at least one instance of the effect of this controversial method of signal control.

Strictly Business

Neo-Flasher Puts "Magic" in Transistor Light

The Neo-Flasher Manufacturing Company has developed a "magic switch" which automatically turns off the Neo-Transistor warning light during the day and turns it on at night. Formerly the labor cost of turning lights on and off each day was greater than the battery savings—consequently, it was customary to leave them running day and night, thus wasting batteries during daylight hours. The "magic switch" control is a fixed part of the light with no loose wires.

The "magic switch" is now available on all Neo-Transistor warning lights and, according to Neo-Flasher Manufacturing Co., will cut battery cost in half.

The Neo-Transistor, Model TR-O (illustrated with the "magic switch") is visible for one mile, has the exclusive "snap-out" bulb socket for easy replacement of bulbs, is weather-proof, and operates for 5 months on two lantern batteries, according to the manufacturer.

For further information, please contact: Neo-Flasher Manufacturing Co., 3210 Valhalla Drive, Burbank, California.

Lighting Installation Uses Radio Control System

First of its kind in the United States, a new radio tone signal activates 280 street lights along State Street, Chicago. The system employs electronic principles widely used in mobile radios throughout the country. Although similar radio techniques have been used to change the programming of traffic signals at intersections in several major U.S. cities, the State Street system is unique in its application of the electronic tone concept to outdoor lighting for illumination purposes.

A 60-watt General Electric radio transmitter station will be located at the Carson Pirie Scott & Company building and will serve as the master signalling device for receivers located in the bases of 28 of the 70 poles involved in the control program. Engineered so that numerous lighting functions can be accomplished either automatically or manually, this station sets up the tone codes which go out in pulses to the pole units.

To automatically provide the lighting functions from the base station, time switches with astronomic dials operate relays at pre-set times. These relays select the proper tone code from the code sender unit which is then sent over the air without wires to the receiving units in the poles.

The time swtiches are provided with astronomic dials which automatically compensate for the change in times of dusk and dawn as the seasons change, thus the relays which select the tone codes to be transmitted are always operated with the dusk or dawn time.

The code sender unit consists of motor driven code wheels which operate microswitches. These microswitches key an audio oscillator which is used to modulate the radio transmitter.

To change the lighting function to an earlier time, pushbutton switches built into the radio station can be used to over-ride a function set on the time clocks.

For maintenance purposes or if a failure occurs in the code sender unit, a dial is included in the station to set up the proper pulse signals.

Salt Institute Publishes Booklet on Snow and Ice Removal

Thirty-eight state highway departments and a preponderance of the major cities in the nation's snow belt use salt in ice and snow removal, according to a recent survey made by the Salt Institute.

The information is contained in a new handbook on salt as a de-icing agent compiled by the Institute for the use of street and highway authorities. Salt's de-icing properties are explained and supported by technical tables.

One section of the booklet is devoted to a discussion of the nature of corrosion. Studies are quoted which show that pure water is more corrosive than salt solutions above a 1 or 2% concentration.

The book reports an Institute survey of cities in the nation's snow belt which showed that salt is used by 100% of the 33 major metropolitan areas with populations ranging from 200,000 upward; by 91% of the 121 cities in the 100,000 to 200,000 population group; and by 75% of the 186 cities with populations ranging from 25,000 to 50,000.

The booklet states that an "unsuspected patch of ice or the icy residue left in the wake of a snow plow can wreak just as much havoc as a snow laden pavement. This hazard increases in scope with heavy traffic densities, and with high driving speeds resulting from improved highway design and increased car horsepower. That is why more and more highway authorities have turned to the use of salt for bare pavement maintenance."

In a discussion on the increased public safety inherent in efficient ice removal programs versus public complaints that de-icing chemicals are corrosive, the booklet states: "Tests have shown that cars corrode standing in a garage in springtime."

A chapter on the nature of corrosion states: "Iron placed in a pile of dry salt will not corrode. Iron wetted by water alone or a salt solution alone will corrode. The answer is that water is the corrosive medium."

Factors which speed corrosion cited in the booklet include: Extreme temperatures to which a car is subjected, ranging from sub-zero in winter to upwards of 150 degrees in direct summer sunlight; humidity caused when a hot motor is driven into a cool garage; dissolved industrial gases, such as sulfur dioxide, nitric oxide and hydrogen, which give moisture in the air a corrosive degree of acidity; rain water which is saturated with oxygen and highly corrosive; and the blasting effect of sand, gravel or cinders.

Copies of the booklet "Use of Salt for Ice and Snow Removal" are available on request from the Salt Institute, 33 North La Salle Street, Chicago 2, Illinois.

Crouse-Hinds Offers New Signal Heads

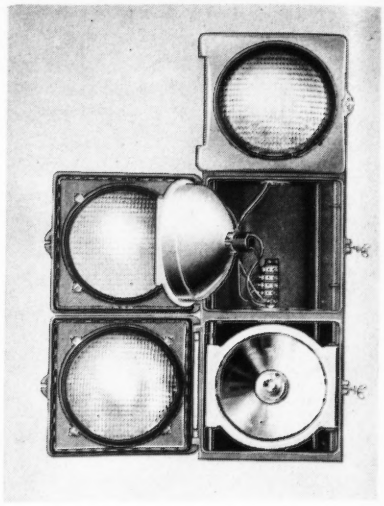
A completely new optical system, providing more light and better light distribution, is an important feature of new Crouse-Hinds Model M-3 Traffic signals. An improved lens with high-polish Alzak aluminum reflector is said to eliminate sun phantom. Adjustable focus receptacles allow for lamp variations. Hood rim is constructed to prevent light leakage. Design of the new signal exceeds revised specifications of the Institute of Traffic Engineers, and in addition to better performance, results in lower installation and maintenance costs, according to the manufacturer.

Model M-3 is housed in a die-cast aluminum chassis enclosing 1, 2, 3, 4, or 5 sections. Each section is self-contained with integral top and bottom, for individual removal and replacement. One-piece reflector assemblies snap in, snap out.

Five-terminal connection block with one spare terminal amply provides for expansion. When the connection block is mounted in the center section, heads can be used interchangeably for post or overhead signals. Locking rings provide for attachment of signal head to bracket arm in 5-degree steps. Model M-3 8″ signals can be assembled with sections of the Crouse-Hinds standard 12″ signal.

Durable chassis design of Model M-3 virtually challenges adverse weather, says Crouse-Hinds. Stainless steel, bronze, and aluminum are used in all vulnerable spots. Long-life door gasket provides weatherproof, dust-tight seal. Terminal markings are permanently cast on housing and cannot be obliterated.

For more information on lightweight,



durable M-3 traffic signals, write Crouse-Hinds Company, Syracuse 1, New York.

Hot Plastic Shown by Cataphote to D.C. Officials

Cataphote executives recently demonstrated a new thermoplastic, reflectorized striping for U. S. Government and District of Columbia officials. They are, left to right, E. H. Toman, Cataphote Corp., Joseph Parlon, Dept. of Highways and Traffic, D. C. Gov't.; Lt. Gen. Eugene Reybold, former chief of engineers, U. S. Army; W. L. Lowry, Cataphote Corp.; (unidentified workman); F. D. Reali, office of chief of engineers, U. S. Army; and Isadore Nimeroff, Bureau of Standards. Test site was heavily traveled U. S. Route 1

intersection. Despite the fact that intersection was part of Washington's north-south 24-hour-daily bottleneck, there was no interruption to traffic. Cataphote Corp., manufacturers of Catatherm, the hot plastic, reflectorized material, has plants in Toledo, Ohio, and Jackson, Miss.

Battery-Operated Flasher Sign Available From Patrol-Lite Division

A new line of Patrol-Lite portable warning flashers has been introduced by the Patrol-Lite Division of American Manufacturing Corp.

Patrol-Lite is a rugged tubular steel portable hand truck with two 7-inch amber lights which flash alternately. The lights are operated by a regular 6-volt battery which is in a tamper-proof locked box. A recharging unit is included with each Patrol-Lite.

A new feature is the large 24-inch square yellow baked enamel sign panel which is worded in large easy-to-read black letters to meet municipal, county or state requirements.

School safety programs can be made more effective with this type of equipment. Street or highway repairs, snow removal, and roadblocks or detours can all be made safer for employees and motorists with Patrol-Lite. Fire and police traffic control at emergencies is easier, safer with a warning flasher worded to direct motorists away from the scene.

Complete specifications can be obtained by writing to Patrol-Lite, Box 266, Warsaw, Indiana. Price of the complete unit is $127.50.

Plywood Sign Panel Catalog Issued by St. Paul & Tacoma

A new catalog on PlyGlaze and PlyAloy overlaid plywood sign panels has been released by St. Paul & Tacoma Lumber Company and is now available to traffic engineers, highway officials and sign shops.

The catalog contains detailed information on the use of Plyglace and PlyAloy for traffic control and commerical signs, as well as performance comparisons with metal signs. Included also are data on costs, availability, sizes, specifications, fabrication and installations. Of particular interest is a section on the resistance of PlyGlaze and PlyAloy to weathering and vandalism.

Copies of the new catalog are available from St. Paul & Tacoma Lumber Company, Tacoma 1, Washington.

Film Available on N.C. Interstate Signing By P & K

Traffic and Street Sign Company and their associate company, Pfaff & Kendall, announce the availability of a color motion picture on the new North Carolina Interstate Highway building program. The movies, taken on the job, show the new highway, the method of installation used, and the type of signing that was specified for this newly-completed road.

Requests for the film should be addressed to Mr. John Alvarado, Pfaff & Kendall, 84 Foundry Street, Newark, New Jersey.

Automatic Closed-Circuit TV Cameras Announced By GE

A new line of automatic closed-circuit television cameras which will automatically adjust to changing light levels has been announced by General Electric.

Designated the TE-6-B and TG-2-B, the cameras utilize a regulated target voltage to maintain a uniform output-signal level over light changes greater than 150 to 1.

Frank P. Barnes, Marketing Manager of Closed-Circuit Television, Electronics Park, Syracuse, said the cameras are designed to meet the demand for low cost, unattended closed-circuit television systems. The equipment is especially adaptable to industrial, military and commercial uses.

Accessories make possible remote aiming of the camera at distances up to one mile. For further information write General Electric Company, Closed-Circuit Television, Electronics Park, Syracuse, New York.

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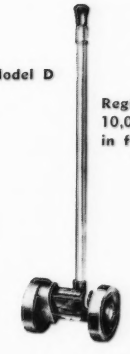

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Institute Affairs

THE 28th ANNUAL MEETING

The 28th Annual Meeting of the Institute of Traffic Engineers was held in Miami Beach, Florida, November 11 to 13, 1958. Just over 700 members, wives and guests were registered for the affair, which was held in the Deauville Hotel on the world-renowned Collins Avenue.

Many members arrived in Miami on Sunday preceding the meeting, which saw a few committee meetings and much pre-convention visiting. On Monday the Board of Direction held a full day's meeting, interrupted only at noon when the Institute played host at a luncheon to representatives of the Sustaining Organizations. Monday evening the ARBA section of the suppliers group was host to an evening of fun in the big Napoleon Room of the Deauville.

Tuesday morning the Technical Council met, and the Board of Direction concluded its unfinished session of the day before.

The meeting officially opened Tuesday noon with a luncheon addressed by the editor of the Miami News. This was followed by the first technical session, featuring the keynote address of W. F. Babcock, Director of Highways for North Carolina.

Director Babcock spoke to the point that the traffic engineer must think in broad terms, must be a specialist in transportation and not just in traffic, and must be a scientist and a public servant both. He emphasized that the traffic engineer should think in terms of the entire transportation system and not just in terms of an intersection or a street. He must avoid becoming so preoccupied with detail that he leaves unsolved the big problems.

Following the keynote address, the 1958 Theodore M. Matson Memorial Award was described by Mr. Burton W. Marsh, chairman of the Award Committee, and Mr. D. Grant Mickle, director of traffic engineering for the Automotive Safety Foundation, was announced as the recipient. Mr. Marsh cited Mr. Mickle's many contributions to the field, including traffic management surveys, and leadership in data collecting techniques and study programs.

Mr. Mickle then presented a paper in which he traced briefly the history of the profession and then singled out several areas of greatest importance lying ahead. Among these, he identified expressway operation; increased efficiency for existing facilities which must continue to carry great volumes of traffic; research and administration.

Following Mr. Mickle on the program was the presentation of the Institute's Past Presidents' Award for 1958 by J. Carl McMonagle, chairman of the judges committee. The winner was named as Martin Wohl, instructor in civil engineering at Massachusetts Institute of Technology, for his paper on measuring vehicle speeds and volumes through the use of stereo photography. Mr. Wohl described his method, using slides. (His full paper appears in this issue.)

The evening entertainment, scheduled for the pool area, had to be moved inside because of high winds. Music and entertainment provided by a second group of suppliers was thoroughly enjoyed, however, even though it was presented under a roof instead of the stars.

The men of the meeting enjoyed the traditional Biscuit Banter Breakfast on Wednesday morning, and then moved into the second technical session. The ladies, meanwhile, were leaving the hotel on a choice of tours to various points of interest around town, followed by a luncheon at the Dupont Plaza Hotel in Miami.

The second technical session began with a paper by K. S. Vaughan-Birch, traffic engineer of Vancouver, B.C. He called for bold thinking in attacking metropolitan traffic problems. He proposed measures which would attract patrons to mass transportation facilities, such as fast, continuous movement, comfortable and at a low fare. He urged consideration of such features as segregated freeway lanes and special freeway loading facilities.

He was followed on the program by O. W. Campbell, manager of Dade County, the new metropolitan government in and around Miami. He emphasized the need for area-wide organization in working on traffic problems. Mr. Samuel Cass, traffic engineer of Metropolitan Toronto, cited the tendency of local units in the metropolitan area to guard jealously their "rights" in the matter of traffic control, and pointed out the advantages of a uniform vehicle and traffic law.

Land-use planning as related to traffic generation and estimation was discussed by Arthur T. Row, assistant director of Philadelphia's City Planning Commission, and by William R. McGrath, traffic engineer of New Haven. They discussed the need for area-wide planning. Emphasized was the need to make some kind of assumptions on transportation before there could be much meaning to any plan. It was indicated that predictive methods in traffic planning were somewhat ahead of similar methods in land-use planning.

C. C. Robinson, of the Automotive Safety Foundation, closed the session with a discussion of the Freeway Operations Seminars which the Institute has held. He pointed out some of the problems brought out by discussion at the seminars, including need for communications, access by emergency vehicles, cross-overs for police, problems of service and rest areas, and others.

On Wednesday afternoon the annual business meeting was held. This is reported in following columns.

On Thursday morning the Technical Council held full sway. The session began with a brief summary of Technical Council activities, and then broke up into six concurrent sessions, some of which lasted well past the luncheon hour. Meanwhile the ladies were enjoying a brunch and a fashion show, following which many went on a shopping tour.

The technical session on Thursday afternoon featured a discussion of electronics in traffic control, with many new ideas and problems presented. Some of the devices were predicted as being in the very near future. Electronics experts advised the audience that traffic engineers should make their needs known. Legal problems that might arise through failure of an electronic device were cited as one of the stumbling blocks to greater use of such equipment.

D. L. Gerlough of California's ITE told of some of the applications of computers to traffic problems. Finally, George W. Howie of Cincinnati and Edmund R. Ricker of the New Jersey Turnpike discussed the problems of

sign uniformity, pointing out some of the current weaknesses in today's practices.

The meeting came to a successful climax Thursday evening with a banquet, followed by a pleasant floor show and dancing.

MINUTES
Annual Business Meeting

Deauville Hotel
Miami Beach, Florida
November 12, 1958

Call to Order

The meeting was called to order by President Havenner at 2:10 p.m. with approximately 200 members present.

Tribute to Deceased Members

Mr. Malo read the names of members who had died since the last meeting:

Frederick J. Eckhardt (Assoc. Mem.)
Died January 28, 1958
H. K. Perkins, Jr. (Assoc. Mem.)
Died March 8, 1958
Clarence W. Hanson (Assoc. Mem.)
Died March 26, 1958
Robert R. Ireland (Assoc. Mem.)
Died May 21, 1958
LeVerne Johnson (Assoc. Mem.)
Died July 7, 1958
Harold G. Eckhardt (Member)
Died August 16, 1958
Harry H. Hemmings (Member)
Died September 27, 1958

Mr. Malo also announced the death in Miami Beach of Kenneth Siddall of Ontario, who had been attending the meeting.

The announcement of the names was followed by a rising tribute and a moment of silence.

Report of the President

President Havenner reported on the highlights of his year in office. He discussed both the administrative and technical aspects of the Institute's operations, and described the duties, responsibilities and accomplishments of the Board of Direction. He emphasized three problems facing the organization: (1) the need to strengthen local Section activity; (2) the need to increase technical activity and production; and (3) the need to improve the magazine. He closed by expressing his thanks to all for their contributions and help.

Appointment of Tellers

President Havenner announced the appointment of tellers as: E. R. Ricker, Robert D. Dier and Ralph H. Sprungman, Chairman. After a final call for ballots, the tellers retired to canvass the ballots.

Report of the Secretary-Treasurer

Mr. Malo reported the membership total at the beginning of the week as 1164, up about 8% from a year ago. The election of 70 new members at this meeting brought the total to 1234.

He also reported that the Institute was currently operating on a $75,000 annual budget, and was living within the budget.

Report of the Executive Secretary

The Executive Secretary reported on the headquarters operation, on Sections and Student Chapters, and urged members to support the magazine through the contribution of articles and by patronizing the advertisers.

Reports of Resolutions Committee

Mr. Gittens read five resolutions, dealing with Freeway Operations Seminars, motor vehicle needs, work of the National Committee on Urban Transportation, navigable water traffic in relation to land traffic, and work of the local arrangements committee. It was VOTED to approve each of the resolutions.

Copies of the resolutions are attached.

Report of Local Arrangements Committee

Mr. Kunde was introduced and was thanked by the President on behalf of the membership for the work of his committee.

Amendments to By-Laws

Mr. Malo read the proposed amendment to the By-Laws relating to dues increase. He reported the need for more staff help to increase technical productivity of the Institute as being the reason for the increase.

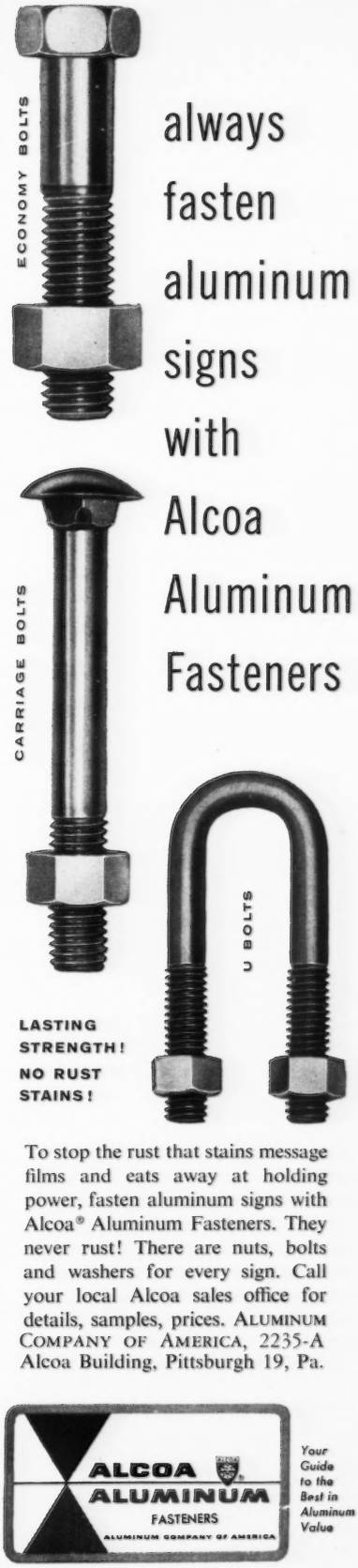
Mr. Gravelle asked about specific plans for use of the money, and it was indicated that the Board was not yet committed to a specific course but had several possible solutions.

It was VOTED that the proposition be passed on to the entire membership for vote, as provided for in the By-Laws.

Election of Officers

Mr. Sprungman, chairman of the tellers, reported the results of the canvass as follows:

For President:
Matthew C. Sielski



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Alger F. Malo
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Gordon K. Gravelle
For Director:
District 3: Tie—Eugene A Barton
Samuel Cass
District 5: M. V. Greer
District 6: J. Al Head

It was VOTED to accept the report and to destroy the ballots.

Note:

At the first meeting of the new Board, in accordance with the provisions of the By-Laws, the Board voted to elect Eugene A. Barton, Director from District 3.

Mr. Havenner then called the newly elected members to the platform, declared them elected. President Sielski then introduced each man, and spoke briefly on his plans for the Institute based on replies to his survey of opinions of some 200 members. Mr. Wetzel and Mr. Malo also spoke briefly.

Adjournment

There being no further business, the meeting adjourned at 3:45 p.m., with President Sielski announcing an immediate meeting of the new Board.

Respectfully submitted,
DAVID M. BALDWIN
Executive Secretary

RESOLUTIONS
ADOPTED AT
The 28th Annual Meeting
Miami Beach, Florida
November 1958

Resolution No. 1

WHEREAS, the Freeway Operations Seminars, sponsored by the Institute of Traffic Engineers, have been enthusiastically received and have demonstrated their value to the profession through the exchange of knowledge and by focusing the attention of city and state officials on this important subject, both within and outside of the Institute membership, and

WHEREAS, presenting this series of seminars is possible only because of the active support and cooperation of a number of individuals and agencies other than the Institute, therefore

BE IT RESOLVED, the Institute of Traffic Engineers commends and thanks the Automotive Safety Foundation, Bureau of Public Roads, American Automobile Association, City of Detroit, Michigan, New Jersey Turnpike Authority, Port of New York Authority and the other agencies giving past and continuing assistance to this valuable activity, and

BE IT FURTHER RESOLVED, the President is herewith directed to transmit this resolution to the above named organizations together with a letter recognizing the individuals participating therein.

ADOPTED by the Institute of Traffic Engineers at the Annual Meeting held in Miami Beach, Florida on November 12, 1958.

Resolution No. 2

WHEREAS, the Nation has embarked on the greatest road construction program in its history through enactment of the Federal-aid Highway Act of 1956 as amended in 1958, thus assuring completion of the National System of Interstate and Defense Highways on a definite timetable while modernizing roads and streets on the ABC system, and

WHEREAS, construction of highways, although of paramount importance, cannot of itself assure the motoring public the continuing safe and convenient transportation service it wants and expects from the highway improvements now underway, and

WHEREAS, improved and adequate transportation service will be realized only if early, careful attention is given to all aspects of highway use and operations involving such governmental functions as motor vehicle administration, law enforcement, traffic operations and others, and

WHEREAS, it has been brought to our attention that responsible state officials have taken cognizance of the need for administrative and legislative leadership in carrying forward a program to determine the present and future requirements and resources needed for proper motor vehicle regulation, for adequate control, and for highway operations, therefore, be it

RESOLVED, that we, the members of the Institute of Traffic Engineers, commend the principle of long-range factual study of the needs of highway use and operation to assure that the street and highway system will provide safe and efficient transportation service.

ADOPTED by the Institute of Traffic Engineers at the Annual Meeting held in Miami Beach, Florida on November 12, 1958.

Resolution No. 3

WHEREAS, there is urgent need for more detailed factual data upon which to base urban and metropolitan area transportation plans, and

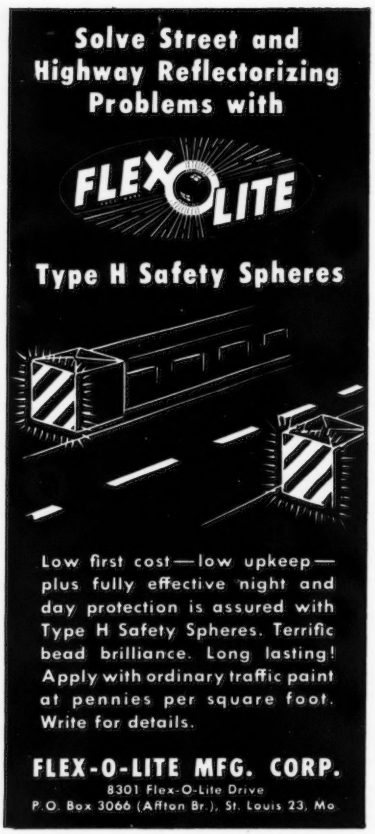
WHEREAS, the development of modern urban highway facilities is now being accelerated, and

WHEREAS, the National Committee on Urban Transportation using the knowledge and assistance of many traffic engineers as well as city planners, transit officials, administrators, lawyers, and others has developed and published a guide to urban transportation planning along with a series of technical procedural manuals, and

WHEREAS, these documents fill a very important need by providing a practical approach to urban transportation planning along with a series of technical procedural manuals, and

WHEREAS, these documents fill a very important need by providing a practical approach to urban transportation planning, now therefore be it

RESOLVED, that the Institute of Traffic Engineers commends the Ameri-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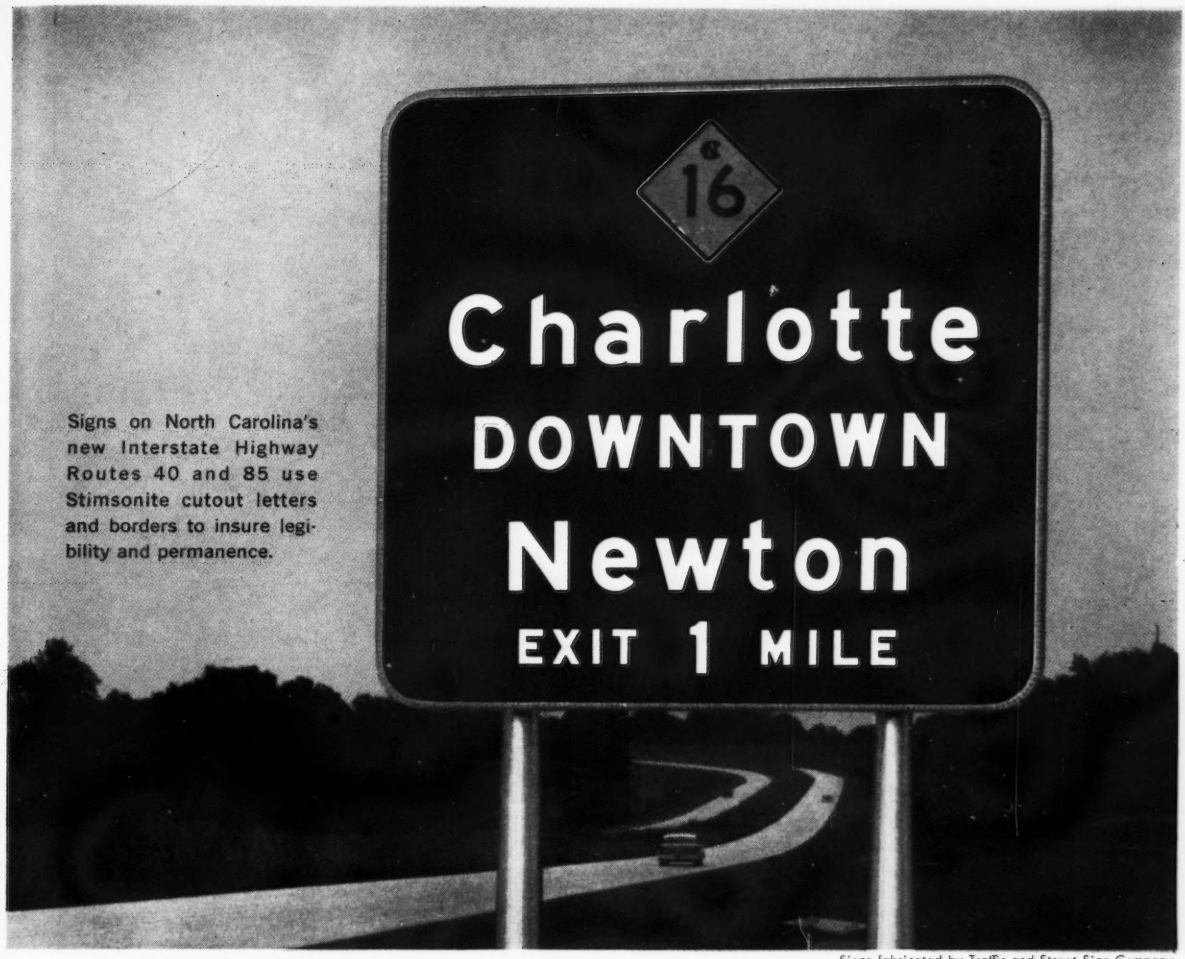

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can Public Works Association, American Municipal Association, International City Managers' Association, National Institute of Municipal Law Officers, Bureau of Public Roads, American Society of Planning Officials, Canadian Federation of Mayors and Municipalities, National Association of County Officials, and Municipal Finance Officers Association of the United States and Canada, comprising the National Committee on Urban Transportation and the Committee's officers and staff for their efforts in the furtherance of this important work, and it is further

RESOLVED, that the individual members of the Institute of Traffic Engineers pledge their continued support to the NCUT program by participation in further development of procedures and in urging adoption of the program by responsible officials.

ADOPTED by the Institute of Traffic Engineers at the Annual Meeting held in Miami Beach, Florida on November 12, 1958.

Resolution No. 4

WHEREAS, inland waterways have played a historic role in the development of our country and this fact was recognized by the Congress of the United States through the passage of various acts which rightly granted inland water borne traffic priority over surface land traffic in accordance with transportation conditions then existing, and

WHEREAS, there has been unprecedented development of surface land transportation and in particular the development of vehicular traffic including emergency vehicles, cargo and service trucks as well as passenger vehicles, and

WHEREAS, the movement of vital highway and street transportation as well as that of emergency vehicles is of such magnitude and importance that any unwarranted interruption of this traffic for the passage of inland waterway craft has a serious and detrimental impact upon the economy and welfare of large segments of population, now therefore

BE IT RESOLVED, that the Institute of Traffic Engineers hereby requests that the appropriate governmental agencies take due cognizance of the ever increasing importance of vehicular traffic to the welfare and economy of our nation and take such action as may be appropriate to eliminate or minimize conflict between vehicular traffic and inland water borne traffic to the end that vehicular traffic be accorded the consideration warranted by its relative importance in fair and just comparison with that of inland water borne traffic, and

BE IT FURTHER RESOLVED, that copies of this resolution be forwarded to the Chairman of the appropriate committees of the Congress of the United States and to the Secretary, Department of the Army and to the Secretary, Department of Commerce.

ADOPTED by the Institute of Traffic Engineers at the Annual Meeting held in Miami Beach, Florida on November 12, 1958.

Resolution No. 5

WHEREAS, the membership of the Institute of Traffic Engineers, assembled in Miami Beach for the 28th Annual Meeting, recognizes the time and effort devoted to the arrangement of an interesting and enjoyable program of technical and social activities, and

WHEREAS, the membership wishes to acknowledge a job well done, therefore be it

RESOLVED, that a sincere expression of appreciation be extended to the Co-Chairmen, George H. Kunde and Earl J. Reeder, to the Local Arrangements Committee, and to all those who contributed so graciously toward the success of the Annual Meeting.

ADOPTED by the Institute of Traffic Engineers at the Annual Meeting held in Miami Beach, Florida on November 12, 1958.

SUMMARY OF BOARD OF DIRECTION MEETINGS

November 10, 11 and 12, 1958
Miami Beach, Florida

The 1957-58 Board of Direction met Monday, November 10 and 11, 1958, and the 1958-59 Board met November 12, 1958, all at Miami Beach, Florida. Significant action at the two meetings included the following.

(1) Heard a report from the Secretary-Treasurer that Institute membership was 1164. Voted to elect 70 new members and to advance 33 members to a higher grade.

(2) Voted to invite four new Affiliates.

(3) Approved three new Sustaining Organizations—J. E. Bauer Co., Kerrigan Iron Works, and Pfaff & Kendall.

(4) Heard that the Institute Life Insurance Plan has paid $42,500 to widows of deceased members.

(5) Discussed local Sections and agreed a member could not belong to more than one Section at a time, but could be on a "guest list" of other Sections.

(6) Accepted with regret the resignation of three members.

(7) Discussed relationship of the Institute to Sustaining Organizations, and appointed a Committee on Sustaining Organizations to explore the question in more detail.

(8) Approved a report from the Technical Council reporting plans for reorganization with not over three project committees in each department.

(9) Voted to approve the appointment of a Nominating Committee for 1959 of H. W. Osborne, A. H. Vey, L. J. Sorenson, H. C. Higgins, and C. W. Prisk, Chairman.

(10) Heard a report from the Chairman of the Handbook Editorial Board, Robert A. Mitchell, that work on a revision of the Handbook is well along, with a mimeographed draft expected next September.

(11) Approved designation of Mr. Wetzel as Administrative Vice President and Mr. Malo as Technical Vice President for 1959.

(12) Voted to hold the 1961 Annual Meeting in Washington, D.C.

(13) Voted to approve Robert E. Dunn as head of Department 5.

(14) Voted to concur in action of the Consulting Engineers Council which objected to a union label on engineering drawings.

(15) Heard President Sielski outline plans for a workshop to discuss the Institute and its future.

Nominating Committee Approved for 1959 By Board of Direction

The Board of Direction has approved a Nominating Committee for 1959 as follows:

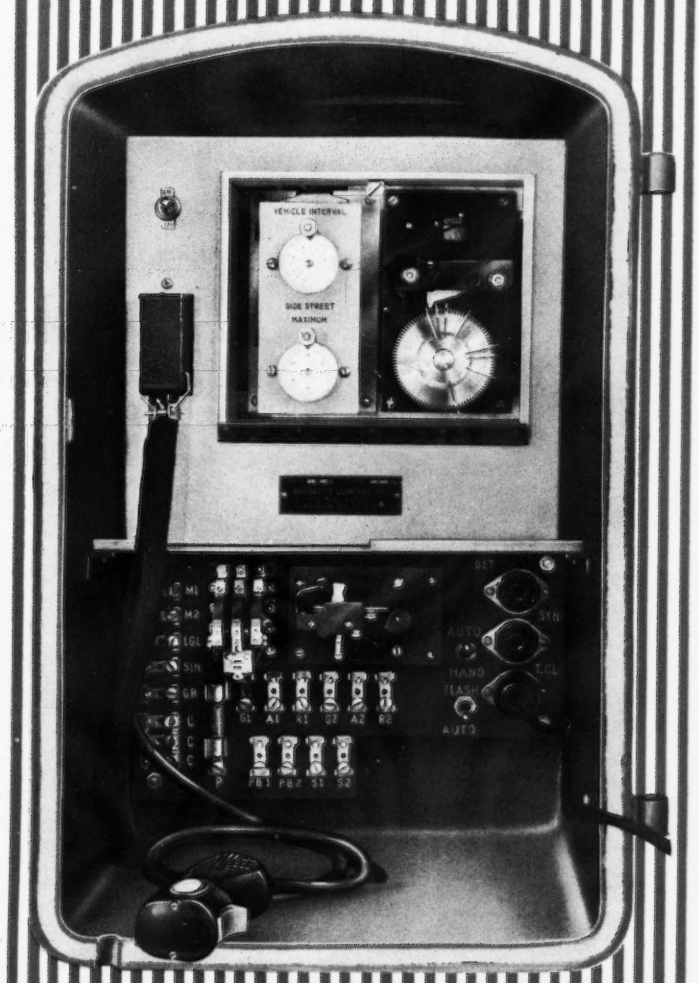
Charles W. Prisk, Chairman
Henry W. Osborne—for District 1
Arnold H. Vey—for District 2
Leslie J. Sorenson—for District 4
Herbert C. Higgins—Member-at-large.

This Nominating Committee is charged with developing a slate of officers to be elected in September 1959. In addition to nominations for President,

MARBELITE

M-20

SVA



USE MARBELITE (P) (D) (Q) TRAFFIC CONTROL EQUIPMENT

(P) **Performance** — The M-20 SVA is an electro mechanical, semi-vehicle actuated controller featuring an unparalleled degree of accurate timing, and consistent operation.

The M-20 SVA provides for addition of accessory units, pedestrian interval timer, synchrolizer for operation in a progressive system, night flashing, fire lane control in addition to time clock control of flashing, all-red and recall operation.

(D) **Dependability** — The key word for the M-20 SVA is dependability. Year in, year out reliability in operation with minimum maintenance. Your programmed maintenance checks will assure long life dependable performance.

Designed for use with detectors of any type, the M-20 SVA can also be supplied for interchange with timer units of other manufacturers.

(Q) **Quality** — Engineered from a view of minimum maintenance, there is no compromise with quality in the M-20 SVA. Basic parts interchangeable with Marbelite M-20 and M-30 controllers utilizing the motor actuated switching unit of proven design and Telechron motor powered vehicle timer.

To avail your community of the finest in traffic control equipment, install . . . MARBELITE.

(P) PERFORMANCE
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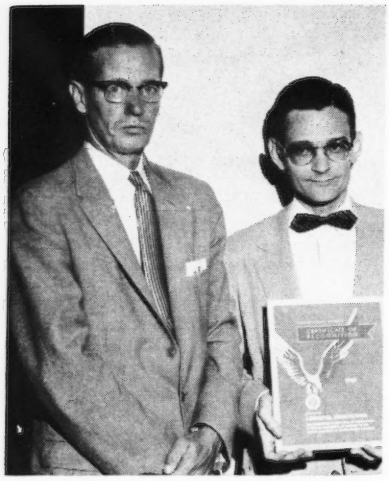

At the ITE award presentation in Lancaster, Pennsylvania, Robert M. Chryst, City Traffic Engineer holds the certificate he has just recieved from Paul D. Muffley, who was at that time the president of the Mid-Atlantic Section.

Vice Presidents and Secretary-Treasurer, the Committee must select candidates for Directors from Districts 1, 2 and 4.

The Committee is required by the By-Laws to complete its work by May 1. Suggestions to be considered by the Committee should be in the hands of the committee at as early a date as possible.

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SAVE TIME!
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Type H Safety Spheres

Assure full-time safety night or day . . . rain or shine, for just pennies per square foot with Type H Reflective Glass Beads. Applied with ordinary traffic paint to: guard rails, safety islands, bridge abutments, barricades, bull noses, curbings, fire hydrants, etc. Terrific, eye-catching brilliance. Write for details.

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Positions Available

PHOENIX, ARIZONA

Position: Assistant Traffic Engineer. This is in a well established and recognized department in a council-manager city of 242,000 and an active annexation program.
Requirements: Graduation from college or university with specialization in traffic engineering. Some experience in traffic engineering work.
Salary: Range of $525 to $600 per month. Liberal policy on vacation, sick leave, pension, and other fringe benefits.
Apply: By January 17, 1959, to Leroy J. Brennan, Personnel Director, City Hall, Phoenix, Arizona.

IOWA CITY, IOWA

Position: City Traffic Engineer to plan, supervise all traffic engineering and traffic engineering functions.
Requirements: College graduate with civil or traffic engineering degree.
Salary: $500.00 to $550.00 per month. Starting salary dependent on qualifications.
Apply: City Manager, City of Iowa City, Iowa.

MINNEAPOLIS - ST. PAUL
Area Transportation Study

Position: Traffic Engineer — Assistant Director — Twin Cities Area Transportation Study.
Requirements: Civil engineer with graduate training and experience in traffic engineering. Unusual opportunity to become familiar with methods used in large metropolitan area study, including electronic analysis and trip assignment to expressways.
Salary: Open, with immediate appointment.
Apply: Lee Nelson, Personnel Department, Minnesota State Highway Department, St. Paul, Minn. Telephone: Capital 2-3013, extension 3103.

WHITE PLAINS, NEW YORK

Title: Traffic Planning Engineer.
Requirements: B.S. in C.E., plus one year of graduate study in traffic engineering, with at least six month's experience in a responsible traffic engineering position.
Salary: $7400 as a minimum starting salary —with a possibility of a higher starting figure for applicants with more experience. A civil service position, with many fringe benefits.
Apply: John M. Gapco, Personnel Director, City Hall, White Plains, New York.

WASHINGTON, D.C.

Position: Associate Signal Engineer; receives special assignments to determine feasibility of proposed new highway construction projects. Conducts studies of effects of proposals on flow of traffic and adequacy of signal lights, considering street capacity, peak hours, estimated volumes of traffic, etc.
Requirements: B.S. in Engineering plus two years specialized training in traffic engineering or equivalent.
Salary: $5985 per annum increasing to $6885.
Apply: Mrs. Evelyn Cummins, Personnel Clerk, Department of Highways and Traffic, Room 420 — District Building, Washington 4, D.C. State full qualifications and work experience in first letter.

ST. LOUIS COUNTY, MISSOURI

Position: Assistant Traffic Engineer. To assist in the development of a traffic engineering program for the recently created St. Louis County Division of Traffic. Work involves a cooperative engineering service in connection with other Governmental Agencies and the 97 Municipalities in St. Louis County.
Requirements: Engineering degree. Graduation from a four year college or university specializing in traffic engineering courses highly desirable. Minimum of one year of Traffic Engineering experience.
Salary Range: $6000 to 7248. Qualified applicant can expect to start above minimum rate of pay.
Apply: Daniel J. Hanson, Traffic Commissioner, St. Louis County Division of Traffic, 115 N. Meramec Avenue, Room 202, Clayton 5, Missouri.

The Institute's traffic engineering award to the City of Cleveland is presented to Mayor Anthony J. Celebreeze by George W. Howie, at the time District Director of ITE. Standing behind the award itself is Robert J. Kelly, Cleveland's Commissioner of Traffic Engineering and Parking, and at the extreme left is his deputy, Joseph W. Andras.

Section News

MIDWEST SECTION

November Meeting

Thirty members of the Midwest Section were in attendance at Chicago's Como Inn for the November meeting. Recent Florida returnees could be readily identified by their sun tans and shaky drinking hands.

Vice President Al Forde officiated at the meeting and introduced Marshall Suloway, Assistant Expressway Engineer, Illinois Division of Highways, who was pinch-hitting for the George Jessel of the slide rule set —Mike Hartigan. Mr. Suloway then presented the guest speaker of the evening, Mr. Caryl Bonotto. Mr. Bonotto is an attorney associated with the firm of Kirkland, Fleming, Green, Martin, and Ellis, and is currently representing the State of Illinois in condemnation proceedings involving highways. His remarks were concerned with the appearance of an engineer as an expert witness in a legal proceeding. Suggestions for individuals in this role were that they be able to qualify as an expert, be well-versed in their subject, follow a logical presentation in introducing facts, and impress the court by being warm, sincere, open, and honest. A lively discussion period followed and revealed the presence of quite a few amateur lawyers in the group.

University of Illinois Conferences

The annual University of Illinois highway and traffic conferences, jointly-sponsored by I.T.E.'s Midwest Section and the U. of I., will be held in Urbana in late February.

The 45th Annual Illinois Highway Engineering Conference will take place on February 24th, 25th, and 26th, 1959, with John W. Hutchinson of the university's Civil Engineering Department as Assistant Director. The 11th Annual Traffic Engineering Conference will follow the highway conference, on February 26 and 27. Midwest Section Member John E. Baerwald will be Director.

WESTERN SECTION

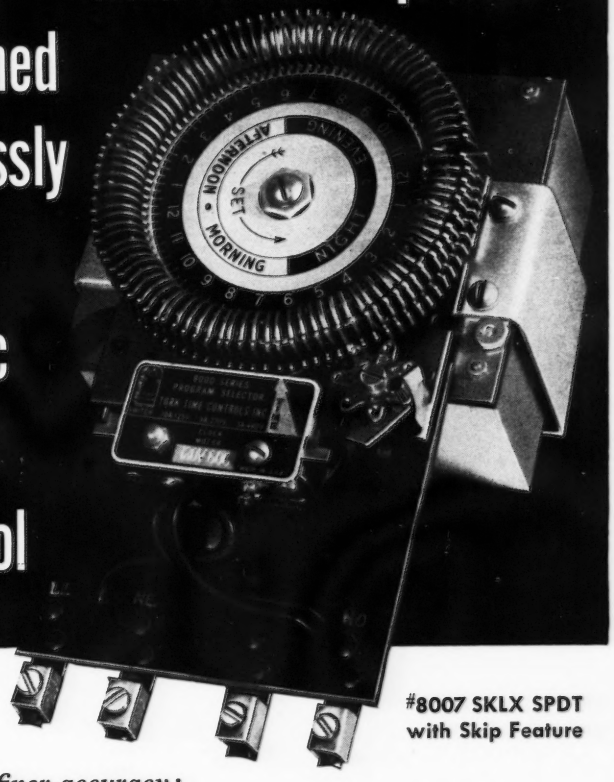
Inter-Mountain Area

Fifteen members and nine guests broke bread at the first quarterly meeting on October 10. After dinner they were joined by four additional guests. Members in attendance from outside the immediate Denver Area included John A. Kennedy from the New Mexico State Highway Department, Bob O'Connell from the Wyoming State Highway Department (who brought along his assistant, Don Bass), Ray Halverson from Utah, Sam Cocharo from Pueblo and John Bradley and his assistant Jay Myers from Colorado Springs. This meeting presented an opportunity to welcome the newest member in this area, Gus Byrom, who recently moved from Miami, Florida to Aurora.

Highlight of the meeting was a very thorough introduction to the Inter-State Signing Manual and the procedures being developed by Al Pepper and his staff for the Inter - State signing in Colorado. Al was followed in the discussion by Vealess Hudspeth with a detailed explanation of the various sign structures, illumination and provisions for maintenance. This was followed by a series of color slides showing existing signing on the completed portion of the Valley Highway and random pictures in other parts of the country. After the meeting, several of the members made a field trip over the completed portion of the Valley Highway.

New TORK
PROGRAM TIME SWITCH
with reserve power

Designed Expressly For Traffic Signal Control



#8007 SKLX SPDT
with Skip Feature

Gives you finer accuracy:

- 96 tabs on 24 hour dial permit 15-minute switching changes.
- Tabs easily tilted in or out by hand.
- 1 to 48 operations a day—15-minute minimum setting.
- Switch position stays the same when adjacent tabs are set alike.
- No conventional ON-OFF trippers to slide around the dial.

Gives you these EXCLUSIVE safety features:

- Keeps time for more than 20 hours after power failure.
- Reserve Spring rewinds electrically 10 times faster than used.
- Reserve spring is automatically "exercised" each day — no chance of locked up spring failing to take over when needed.

Here's the safest, most accurate time switch made for traffic signal control. Enthusiastically acclaimed and specified by those who have seen and tested. it. WRITE NOW TO DEPT. T-1 FOR FULL DETAILS.

TORK TIME CONTROLS, INC.
MOUNT VERNON, NEW YORK

In Canada: DOMINION ELECTRIC MANUFACTURING CO., LTD., TORONTO

Denver won at least a temporary victory in the courts a few weeks ago with the upholding of its ordinances prohibiting the erection of billboards within 600 feet of the Valley Highway. There were indications that the billboards advertising company planned to appeal the decision, but as yet no such action has been taken.

From Dale Hamilton in Boise come the following items of interest: Cecil Hathaway has recently been appointed to head the Geometric Design, and Signing & Striping Departments for the Traffic and Planning Division of the Idaho Department of Highways. Cecil returned to Idaho fresh from Berkeley where he had been doing post-graduate work in Traffic Engineering.

Cecil is a native Idahoan, growing up in the Coeur d' Alene area and taking his undergraduate work at the University of Idaho. Prior to attending the University of California, he served as City Engineer in Lewiston and as an instructor at the University of Idaho. With the interstate highway program in full swing, Cecil finds his work has been cut out for him in big chunks.

John Boesel, recently moved from Riverside, California to Boise, Idaho where John is now with the Idaho Department of Highways. John was previously employed in the Traffic & Planning Division of Los Angeles County, making accident studies prior to serving as Office Engineer for the Engineering Division of the City of Riverside. Accident studies are again his chief interest for Idaho, being responsible for that group within the Traffic Section. While John and his family moved so that they could enjoy Idaho's contrasting seasons, the Department feels that they are the recipient of a good man. His background in accident studies and original thinking has already produced some worthwhile ideas for the betterment of his group.

In response to the objectives of the joint committee on highways of AMA and AASHO, the Idaho Planning & Traffic Division has implemented studies for Nampa, Boise and Idaho Falls. The degree of cooperation between these municipalities and the State have been very high on these projects.

The Boise Valley Interstate Route Study was completed and approved. The route chosen was peculiar in that it was not the route of least benefit cost ratio. It was found that the assignment of traffic factor and other factors, out-weighed the benefit cost ratio in this particular study. Anyone interested in the summary of analysis can obtain same by contacting the: State of Idaho, Department of Highways, Planning & Traffic Section, Box 879, Boise, Idaho.

Jay Myers, Assistant in the Colorado Springs Traffic Engineering Department, attended the short course on Traffic Engineering at the Institute of Transportation & Traffic Engineering, University of California. This is one of the steps in Jay's in-service training program given him in order to train him for the position of Assistant Traffic Engineer in Colorado Springs. Jay has been with the Traffic Engineering Department for five years—four of which were as Foreman of the Street Painting & Signing Crew. During the past year Jay has been assisting the Traffic Engineer in all phases of running the Traffic Engineering Department.

Colorado Springs has installed its first traffic signal with pedestrian WALK-WAIT lights. This was installed in connection with a semi-actuated electromatic controller at a problem intersection located adjacent to a school. The signal also has a fire lane preemptor controlled from a fire station one block from the signal. The WALK-WAIT lights have been a big hit with the local citizens—the only problem is digging up enough money to install more of this type installation.

Colorado Springs has also undertaken an extensive school crosswalk painting program. This consists of a wiggly, snake-like, yellow line starting at a point in the center of the driving lane about 150 feet from the crosswalk, and gradually growing until it occupies the entire driving lane at the crosswalks. The crosswalks are also painted yellow, and "YIELD TO PEDESTRIAN" signs are located at each one of these crosswalks. "SCHOOL CROSSWALKS AHEAD" signs are installed in advance of each installation. Warrants for this type of school crossing protection are a minimum of 20 students crossing against 200 cars per hour.

Plans are underway for Colorado Springs' first one-way system. This system is in conection with the Bijou Street Bridge, which connects with the Monument Valley Freeway being built through town. The streets involved are Kiowa and Bijou, two downtown streets which connect with this bridge.

Gus Byrom is presently keeping himself occupied in Aurora with the installation of six new fixed-time inter-conected multi-dial controllers along E. Colfax Avenue.

The Colorado Department of Highways is about to install Interstate signing deep in the heart of the Rocky Mountains near the Continental Divide, and recently, when Al Pepper and Vealess Hudspeth were reviewing the signing plan in the field, they ran into a very unique situation in the old mining town of Idaho Springs. It seems that the whole highway is setting on mineral rights, specifically gold and silver claims, and in digging for footings and foundations for sign bridges there was every possibility that a new vein could be uncovered; therefore, Al says they expect to send a crew into the vicinity with gold pans and balances to make certain that none of the 19th Century claims will be disturbed without sharing the wealth with Silver Dollar Tabor's descendents.

Further, since the Air Force Academy football team has entered into the big time this year with a resounding start, particularly the tie with the Big Ten Power—Iowa, (and possibly over Stanford, results of which will be known by the time this WesternITE edition has been printed) the exuberance of the Command and the Cadets themselves at Colorado Springs has prompted a request that they be allowed to add the sillouette of the Falcon mascot to the Interstate signs which identify the entrance to the Academy. Looking toward the future when we may enjoy the spectacle of the Army and Navy teams, as well as the West Coast Powers, coming to this area for games, it has been very difficult for Al with his local pride to hold the line and reject the suggestion. (The Falcons beat Stanford 16-0—Ed.)

Ten years of blood, sweat and toil were rewarded Sunday, November 23 with the opening of the final section of the Denver Valley Highway. For the first time motorists were able to negotiate the entire Valley Highway from the north city limits to the south city limits. No longer will it be necessary for travelers from Boulder to negotiate surface streets in Denver on their way to Colorado Springs and Pueblo. Ever since November 19, 1948, when the first major construction work began on the Valley Highway, the engineers and the public alike have looked for this day when thru traffic would no longer need to make use of existing surface streets in Denver. And now, ten years later, their vision has become a reality. The Denver Valley Highway is 11.2 miles long. It contains 62 bridges, and there are 54 miles of two-lane roadway including ramps and service roads. Within the right of way of the Valley Highway are over 73 miles of pipe ranging in size from 1½ inches in diameter to 78 inches for the concrete sewers. Approximately 5,000,000 cubic yards of dirt were moved in the process of this construction. The concrete required to build the bridges, curb, gutters and pavement amounted to 130,000 cubic yards. Conduits for wires for highway lighting are approximately 100 miles. The highway has been built at a total cost of slightly over $33 million of which over $10.3 million has been spent for right of way. At the time the Valley Highway was started, it was felt that the four lane facility would be sufficient to carry traffic for several years, but recent large scale developments by industry in the Denver area, have increased the flow of traffic to the point that it now can be seen that it will be necessary to provide six lanes of roadway. Fortunately, this was considered a possibility at the time of the incepiton of the highway and provision had been made for future widening. At its opening, 6 lanes were already provided in the section between West Alameda Avenue and Market Street, that portion of the highway which will be carrying the heaviest load into and out of the downtown business area. However, plans of the State Highway Department call for widening of the remainder of the Valley Highway to its full 6 lanes in the not too distant future. Untold, hundreds of man hours of work have gone into the construction of the Valley Highway by the Traffic Engineering Section of the City of Denver; although the results of this work will never appear in the final analysis. Numerous detours had to be constructed allowing traffic to by-pass the construction areas. With each of these detours many temporary traffic signals had to be installed to provide for the safe movement of traffic. In addition, many other signals were installed at off-ramps and service roads to provide for a safer ingress and egress to the highway. Denver is now considering the advisability of installing "trail blazers" along routes leading to the Valley Highway. With the completion of the Denver Valley Highway, a portion of Interstate route 25, we now have a four lane divided highway extending from Boulder to Colorado Springs. Construction of the freeway by-passing Colorado Springs, will provide us with a continuation of this highway to Pueblo within the next year or two.

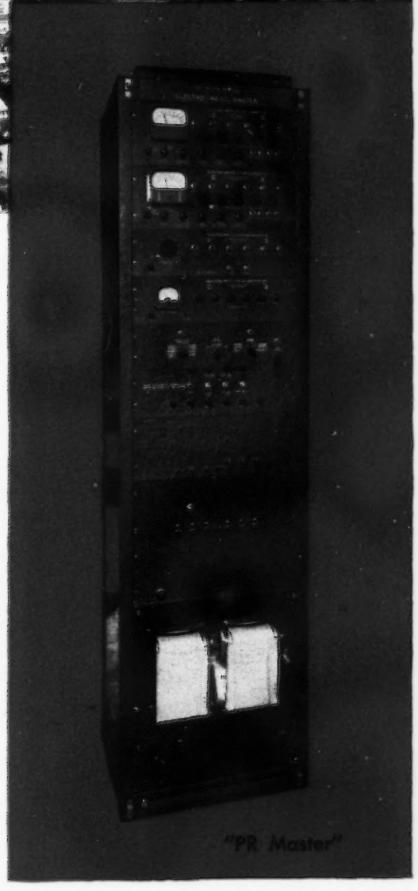
Early traffic counts on the incomplete northern section showed an ADT of 40,000 VPD. These indications would envision an ADT of at least 60,000 VPD on the entire highway in the immediate future.

Canadian Area

Ken Vaughan-Birch spent the last week of September in Montreal where he attended meetings of the Signs & Signals Sub-Committees of the Joint Committee on Uniform Traffic Control Devices for Canada and the annual meeting of the Technical Committee of the Canadian Good Roads Association. Of particular interest is the fact that because of the bilingual problem in Eastern Canada, the Signs Sub-Committee will be recommending to the Joint Committee the use of a number of symbol signs rather than the now commonly used legend signs. It was further agreed to carry out more research on symbol signs for the purpose of extending their use.

Ken attended the Signals Sub-Committee Meeting for Fred Hole, who was unable to make the long trek to Montreal. He reports

SAN ANTONIO LOOKS TO 1970.... with its NEW Traffic Signal System



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Handling today's traffic is difficult enough, but to provide signal controls for expected 1970 traffic volumes is a major accomplishment. San Antonio did just that. They selected a flexible, versatile system that not only puts an end to downtown traffic snarls but insures movement of maximum volumes in the years to come.

An ultramodern all-electronic "PR" System controls 153 intersections in the heart of vital, growing San Antonio. All changes in volume and direction of traffic are constantly recorded and the most effective signal indications automatically computed and put into effect smoothly and without delay.

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"PR Local"

AUTOMATIC SIGNAL DIVISION
EASTERN INDUSTRIES, INC.
NORWALK, CONNECTICUT

TRAFFIC ACTUATED

that the Signals Sub-Committee approved the use of delay warrants. It was recognized that research is still incomplete in this field, but it was felt that delay warrants as proposed are better than existing warrants. These new warrants will be revised from time to time in accordance with results of further research.

At the meeting of the Canadian Good Roads Association, Ken presented a paper entitled "Planning for Future Transportation in Central Business Districts of Metropolitan Areas." He will present a similar paper to the National Convention of the ITE in Miami this month.

Unfortunately, BC has lost one of its few ITE members. Roy Cowley resigned from the BC Department of Highways in September to accept a new position in Ontario.

Roy graduated in Chemical Engineering and somehow, after various chemical engineering jobs, joined the Department of Highways on construction projects. In 1952 he was transferred to the Traffic Branch at Victoria and has been Asst. Traffic Engineer under John Harding ever since. His work included supervision of a modern highway sign shop, design of traffic signals, supervision of traffic line painting and development of traffic line paint testing procedures, particularly field evaluation of paints and supervision of origin and destination surveys. Necessarily his work has included other aspects of traffic engineering.

He has accepted a job as Traffic Engineer with the Department of Transport with the Province of Ontario, a new government department, and has moved with his wife and two boys to Toronto. Just how traffic engineering responsibilities are split between the Department of Transport and the existing Department of Highways is not too clear, but it appears that the Traffic Engineer of the Department of Highways, Walter MacNee, will restrict his work mainly to new highways.

Arizona-New Mexico Area

(Editor's Note: Arnold Johnson points out that TE was in error last month when it named him instead of John Kennedy as the recipient of a 5-year Citation from the President of the United States for Draft Board Services. Thanks Arnold, and our humblest apologies to you, John.)

In Phoenix this past month the major controversy was whether parking should be removed on one of the major downtown streets—namely Central Avenue. A hearing was held with the City Council presiding and Chuck Haley's report recommending the removal was accepted. This plan went into effect Monday, October 20, 1958.

Approximately one-quarter mile of median islands that were installed in front of a large shopping center in Phoenix are being landscaped at the present time. This landscaping plan was developed by the Planning & Parks Departments and consisted of a variety of trees and shrubbery with natural-colored stone in various designs. The Division of Traffic Engineering in Phoenix is withholding comment on the practicality of using colored stone.

John Kennedy, as Area Chairman, is trying to set up a joint meeting for the Arizona-New Mexico Area. The location of this meeting is as yet undecided, but it is sincerely planned to hold one before the next Western Section ITE Convention.

The Arizona Conference on Streets and Highways was held in Tucson on October 24 and 25.

Arnold Johnson is leaving the City of Phoenix to work for the Traffic Engineering Department in the Arizona State Highway Department. This move is scheduled for the latter part of November.

The Arizona Highway Department is moving forward on the programmed freeway along the west and south sides of the City of Phoenix. Two interchanges are opened and in operation, and two other bridges for grade separation will be constructed in the near future.

In the City of Phoenix one City-operated metered parking lot of 22 spaces and an additional piece of land owned by the City have been leased to private operators for a parking area. This reflects the trend in Phoenix to get the private developer to provide off-street parking. The City of Phoenix now maintains only two small off-street metered parking areas which have a total of 40 spaces, and there is a 400-car capacity underground parking garage privately operated on City-owned land.

San Diego Area

The City of San Diego has installed two sign bridges, a 48-foot all aluminum including the signs and a 58-foot steel bridge with high density plywood signs. Messages on both installations are reflective type button cut-out letters.

The San Diego area held a dinner, workshop meeting at the Hotel San Diego on Friday, October 10. Guest Workshoppers were Lt. Warren Morrison of the San Diego Police Department and Dick Swart of the Auto Club. Subject of the meeting was a lively discussion of the recent Governor's Safety Conference led by Area Chairman Ed Hall.

Paul Fowler reports the County has made a test installation of four foot stop signs with anticipation that they will correct the violations of running the signs. All advance warning signs and pavement markings have been used prior to the installation to no avail. (Maybe there's more than one nearsighted Mr. McGoo.)

Ed Hall announces that a comprehensive Downtown Parking Report for the City of San Diego has just been published. This report summarizes a two-year study of supply, parking characteristics, meter revenues and an estimate of future parking needs. Stephen George, Jr. has been directly in charge of the field studies and the preparation of this report. The parking needs were estimated for 1971 in order to provide comparable data for the 1971 Highway Needs Study. An effort is being made to study the economic balance of highways, parking and transit.

Paul Fowler and Ben Dobbins in the County Road Department, claim they feel like the goldfish who watched someone pulling the drain plug out of the aquarium. Their anticipated deluge of traffic is developing on schedule after the County opened a long-awaited by-pass route for the State's major freeway reconstruction of US 80. Forty per cent of the average daily traffic flow passes in the two peak hours. Don Robbins, of the City Traffic Engineer's Office, claims a reduction of 20 minutes' travel time from the Civic Center to his home as a result.

The public presentation of two years of intensive study of the Central District parking in San Diego was made at a public meeting by Ed Hall and Steve George. The public meeting was preceded by a press conference. The parking studies led to the 1971 parking needs estimate of the need for approximately 3,900 additional spaces at a cost of aproximately 14.5 million dollars. It was emphasized that this could be provided at an average rate of approximately 270 spaces per year at an average cost of approximately one million dollars per year.

Keith Gilbert has developed a machine process for the analysis of the cordon counts. The third annual cordon count field data has been completed and the processing of the data has begun.

Bay Area

Ross Shoaf, as Vice President of the Western Section of ITE, presented to Oakland's Jay Czizek a Certificate of Recognition from the ITE for Oakland's high level of performance of traffic engineering as reported in the National Safety Council's Annual Survey of traffic safety activities. Congratulations to Jay and the "All American" city.

Ross also reports that PropositionI on the San Francisco ballot is the first step in consolidating traffic engineering under the Department of Public Works. This proposition changes responsibilities for traffic control devices from the Police to Public Works.

The Eleventh Annual California Street and Highway Conference is beginning to take shape. It will be held on the Berkeley Campus, January 28-30, 1959. A banquet will be sponsored by the Bay Area Group in conjunction with the Conference on Thursday, January 29th.

Jim Kell reports that the Extension Course, "Fundamentals of Traffic Engineering," will probably be offered in San Francisco during the spring semester.

The ITTE has the largest class in its history this year. Thirty-six students are enrolled in Transportation Engineering with twenty being full-time students. Nine students are from foreign countries, including Argentina, Canada (3), England (2), Japan, Portugal, and Switzerland.

Bill Dundas from Mark Kermit's staff in Contra Costa County reports the formation of a Student Protection Committee. Since school bus operation has been drastically curtailed in the county this year, there has been considerable pressure to force the provision of walkways and sidewalks in the rural areas. This committee will serve as a collector agency for the requests, and hopefully will ease some of the pressure on the county administration.

Sacramento Area

Two retirements in the Division of Highways last month resulted, naturally, in two promotions. Clarence E. Bovey, Engineer, City and Cooperative Projects, retired, and Mel West was named to succeed him. Sam Osofsky was named to succeed K. A. MacLachlan, Highway Economist. Congratulations! Mel, Sam; and Pleasant Days in the Sun! Clarence, Mac.

Washington Area

The November Area Meeting held at the Top of the Ocean Restaurant in Tacoma, was attended by 17 area members and 7 guests.

District Director Herb Higgins discussed potential membership changes and it was generally conceded that more could be done to encourage student interest through distribution of ITE publications and material if formation of student chapters is not feasible. The membership also aproved of a "Life Member" type of grade designed to accommodate retired members.

The Washington Area members of the Western Section ITE co-sponsored and served as the faculty for a short course on Traffic Engineering Fundamentals recently. This five-day course was given at the Uni-

(Continued on page 51)

(Continued from page 19)

The speed S_B of any vehicle, such as B, is: (See Figure 4)

$$S_B = S_p \left(\frac{D_B}{D_B + D}\right)$$

The plane speed S_p is known; D and $D_B + D$ can be scaled directly from the strip photo. Therefore, both D_B and S_B can be determined.

The volume V of any group of vehicles (such as A, B, C, and D) is: (See Figure 5)

$$V = \frac{\bar{S}\,(n - 1)\,S_p}{D_T\,(S_p - S_D)}$$

D_T and $\bar{n}$ can be obtained directly from the strip photo; the speed S_D of the last vehicle in line can be calculated from the speed formula; and S is the arithmetic mean of all individual vehicle speeds in the group.

The virtues of using strip photography would be the speed of collecting the data, possibility of automatic processing, and elimination of adjustment of data to a base and of separate collection processes.

Acknowledgements

The author would like to extend his sincere appreciation to those who have helped and encouraged him in his efforts to initialize this photographic method. Particular appreciation should be given to Profs. Charles L. Miller and A. Scheffer Lang of MIT for their encouragement, to Mr. Daniel R. Schurz of MIT for his technical assistance, and to Messrs. John Wolvin and Stephen Sickle of Chicago Aerial Industries for their interest and support in behalf of the proposal.

Bibliography

1. Howie, George W. and Young, Thomas E., "The Traffic Counting Program in Cincinnati." Proceedings, Highway Research Board, 1957.
2. Keefer, Louis E., "The Relation Between Speed and Volume on Urban Streets." Presented at the Highway Research Board, 1958.
3. Mortimer, William J., "Moving Vehicle Method of Estimating Traffic Volumes and Speeds." Bulletin 156, Highway Research Board.
4. Petroff, Boris B., "Observations Concerning Urban Traffic Volume Patterns in Tennessee." Presented at the Highway Research Board, 1958.
5. Walker, William P., "Speed and Travel Time Measurement in Urban Areas." Bulletin 156, Highway Research Board.
6. Wolvin, John H., "Engineering Uses of Sonne Strip Photography." Journal of Pipeline Division, A.S.C.E., June 1958.
7. *Manual of Photogrammetry*, published by the American Society of Photogrammetry.

The above photo shows the first over-head guide signs ever used in the state of Utah. CAMEO'S new A-10 laminated sign panels were erected on Alcoa Aluminum Unitube supports. Background color is daylight green. Aluminum letters, arrows and borders are white porcelain enamel with AGA Stimsonite reflectors.

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Acting City Traffic Engineer, 125 Armory Street, Springfield, Massachusetts. December 2, 1958 for ASSOCIATE grade.

CARTWRIGHT, Leonard
Operations Engineer, Main Roads Department, 5 Malcohm Street, Perth, Western Australia. October 29, 1958 for ASSOCIATE grade.

FOXWORTH, DeVere M.
Transportation and Traffic Officer, U.S. Army, Transportation Research and Engineering Command, Fort Eustis, Virginia. December 2, 1958 for JUNIOR grade.

GERDES, Charles M.
Highway Engineer, U. S. Bureau of Public Roads, 105 North Front Street, Harrisburg, Pennsylvania. November 20, 1958 for JUNIOR grade.

KAHL, William R.
Partner, Rummel, Klepper and Kahl, 1021 North Calvert Street, Baltimore 2, Maryland. November 17, 1958 for ASSOCIATE grade.

KNIGHT, Lee O.
City Traffic Engineer, 516 East Grand Avenue, Ponca City, Oklahoma. November 26, 1958 for JUNIOR grade.

MYLROIE, Willa W.
Associate Highway Engineer, Washington State Department of Highways, Olympia, Washington. November 20, 1958 for ASSOCIATE grade.

RODRIGUEZ, Luis G.
Chief, Traffic Division, Department of Public Works, San Juan, Puerto Rico. October 30, 1958 for ASSOCIATE grade.

VILLEMUR, Jean
Section Engineer, Design and Planning, Traffic Department, City, 1125 Ontario Street East, Montreal, Quebec, Canada.

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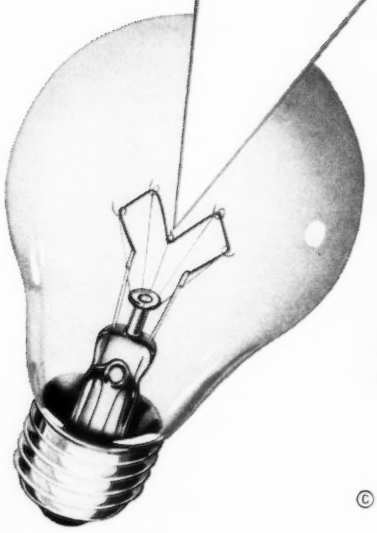

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(Continued from page 48)

versity of Washington during the week of November 11th, and approximately 40 persons attended. Chairman Roy Sawhill with Tom McLeod and Bruce Culver formed the short course committee.

Oregon Area

Bill Zirbes, of the Traffic Engineering Division, and Robert Judson, of the Maintenance Division, have just spent a week at Los Angeles learning more about maintenance and application of volume density, multi-phase traffic actuated signals. "Skinny" DeYoung was very hospitable during the week, and it is understood that some after hour training was absorbed.

For those persons in the Portland Area interested in Traffic Engineering, the Adult Education Extension Center is currently conducting a ten-week Traffic Engineering Course under the supervision of Martin Coopey of Oregon State College. J. Al Head, Ted Dec, Bill Albright, Bob Blensly, Bruce Crandall, Bud George, Bob Conklin, Dennis Peterson and Val Johnson of the Oregon State Highway Department; Bill Weller, Don Bergstrom City of Portland; and Don Black of Portland General Electric, are the instructors. This course may be given again in the Salem Area.

METROPOLITAN (N.Y.) SECTION

The Greater New York Safety Council meeting will be held on Tuesday, April 14, 1959 at the Hotel Statler. The traffic engineering session that morning will be on the subject of the inter-relation of agencies in the control of traffic. The Chairman will be Lou Bender. Speaking on a jurist's view of control of traffic is Judge Murtagh, Chief Magistrate of the City of New York. John Crosby, Asst. Traffic Engineer, New Jersey Turnpike Authority, will speak on the controlled access highway. Speaking from the parkway engineer's view will be Charles Pound, General Superintendent, Westchester Park Commission.

Arnold Fisch reports that the New York Thruway Authority is in the process of letting contracts to resign the Yonkers section of the Thruway with permanent structures and signs.

Lloyd A. Maeder reports that the State has 1,658 signal installations on State Highways. 775 of these are fixed-time and 469 are semi-vehicle actuated.

Ed Wetzel attended the AASHO meeting in San Francisco as Chairman of the ITE Seminar Steering Committee. He was invited by AASHO to discuss questions asked at seminars to-date on emergency services and traffic control of limited access highways.

Ed Cantilli of the Port Authority and John Crosby of the Jersey Turnpike were awarded honorable mentions in the Past Presidents' Award at the recent ITE annual meeting for their papers on "Statistical Evaluation of Traffic Accident Severity" and "Accident Experience on the Jersey Turnpike," respectively. Ed presented his paper to the Highway Research Board last January.

Roy Cottam and Larry Lawton addressed the December 3rd meeting of the International Radio Engineers on "Traffic Control Devices."

Westchester County will begin a program shortly of testing various types of median dividers. 150 foot sections of various types of concrete, concrete and steel, back-to-back steel flex-beam, and back-to-back aluminum flex-beam will be used. Vehicles will be guided by remote control units. Testing will be held on an abandoned section of the Central Westchester Parkway.

H. Jack Leonard was admitted on the 1st of November as a partner in the firm of Edwards and Kelcey.

An evening dinner meeting was held at the National Arts Club in New York City on October 13. This was the initial meeting of the 1958-59 Section Year and a total of thirty-two (32) members and guests attended. In the absence of President Arnold Fisch, Gordon Gravelle, Section Vice President presided. We were particularly happy to have as honored guests, Mr. Joseph E. Havenner, President of the Institute of Traffic Engineers and Mr. R. H. (Sam) Baldock, former Chief Engineer of the Oregon State Highway Department and now highway consultant for the firm of Edwards and Kelcey.

Gordon Gravelle introduced our speaker for the evening, Mr. Sergei N. Grimm, Planning Consultant and Consulting Engineer, Syracuse, New York. Mr. Grimm was the former Director of Planning for the City of Syracuse.

Mr. Grimm discussed "New Concepts of Urban Planning and the New Role of the Traffic Engineer." The underlying theme of Mr. Grimm's discussion centered on appreciation by planners and traffic engineers, of each others' professions, in order that their respective abilities and techniques can be integrated in an effort to provide better future planning.

The traffic engineer, he said, must become more aggressive—intellectually and otherwise, or planners will attempt to expand their own function beyond their capable limit and into the realm of the traffic engineer.

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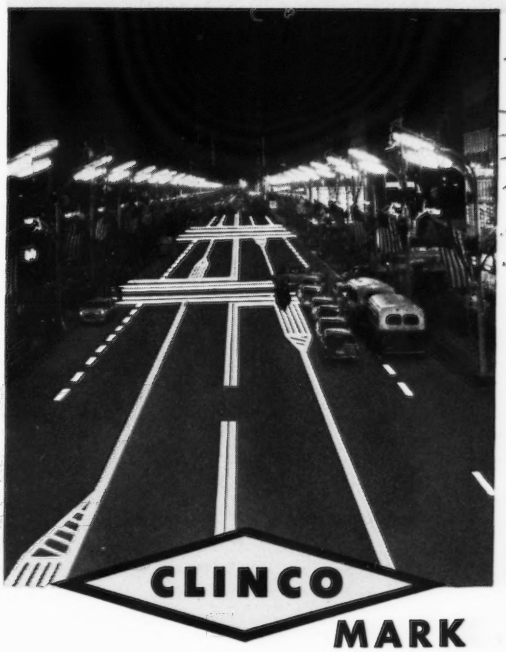

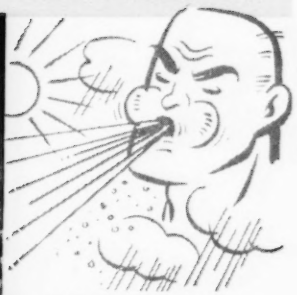

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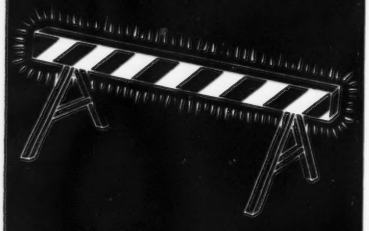

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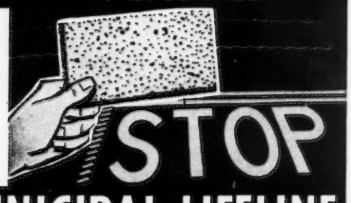

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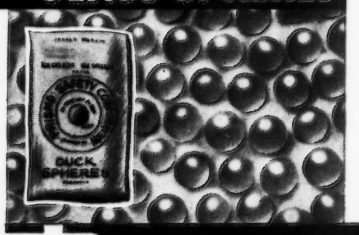

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